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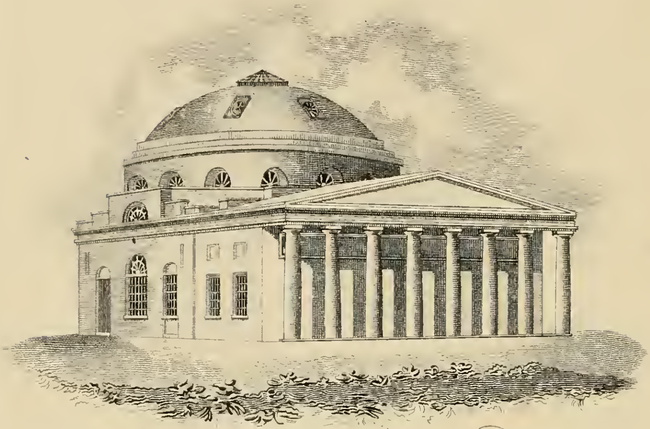

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SOME OBSTETRIC ENDOCRINE PROBLEMS* †

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Although gynecologists appear to have preempted for clinical application many of the advances of recent years in the field of reproductive physiology, it must be remembered that much of this new knowledge likewise has definite bearings on the clinical problems of the obstetrician. The latter, like the former, must be familiar with such fundamental problems as menstruation and ovulation. Moreover, even more than the gynecologist he must know something of the endocrine factors which come into play during pregnancy and the puerperium. That the hormones do play an important part during these phases of the woman's life is well established.

To start at the beginning, the very act of copulation presupposes an essentially normal endocrine system in both partners. Furthermore, the production of ova in the female and of spermatozoa in the male is under endocrine control, as witnessed by the sterility of anovulatory women and that of some forms of azoospermia in men. The extrusion of ova from the ovary and their transport through the tubes are likewise dependent upon endocrine factors, whereas the implantation of the fertilized egg in the uterus, as well as the maintenance of this nidation in the early stages of pregnancy, are possible only because of the hormone function of the corpus luteum. The story can be carried to later stages of pregnancy as well, when the placental hormones take over this protective function. Even the termination of pregnancy at parturition is undoubtedly caused by the rather abrupt change which then occurs in the endocrine pattern. Finally, after parturition the

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phenomena of lactation are evoked by endocrine forces which come into play soon after expulsion of the fetus and the placenta.

Only a few of the many obstetric endocrine problems can be touched upon in this short discussion, and it will soon be evident that knowledge of this subject is woefully incomplete on many points. Clinical endocrinology, if it is to be applied intelligently in obstetrics or in any other field of practice, must be based upon what is known of the physiology of the endocrines. It is with the latter rather than with actual clinical application that this short paper will be concerned, with perhaps only an occasional divagation to indicate the bearing of experimental study on some particular clinical problem.

It will be assumed that the reader is more or less familiar with some of the better known advances in the endocrinology of reproduction, and the discussion will be devoted to a few selected questions in which it would appear that the obstetrician should be interested and in which recent work is bringing about changing concepts.

The particular problems which have been selected are: 1) the hormone role of the corpus luteum and the placenta in pregnancy; 2) the influence of various hormones upon the motility of the uterine musculature; 3) the probable role of the hormones in the initiation of labor; 4) the endocrines concerned in mammary development and in lactation; and 5) the behavior of menstruation and ovulation during lactation. Many other topics suggest themselves but those mentioned must suffice in this discussion. In some of these problems important advances have been made in the past few years; in others it cannot be said that a great deal has been added to established facts or to previously accepted theories.

THE ROLE OF THE CORPUS LUTEUM AND THE PLACENTA IN PREGNANCY

The numerous studies of the past few years have apparently established the sequential roles of the corpus luteum of pregnancy and the placental trophoblast in the production of progesterone. The placenta likewise produces large amounts of estrogen, far larger than the ovary, and in addition is the source of the chorionic gonadotropic hormone found in such large quantity in the urine of pregnant women. The work of Browne, Henry, and Venning (1) indicates that on the basis of pregnandiol excretion studies the placenta takes over the chief burden of progesterone production from the corpus luteum at a comparatively early stage of pregnancy, from the late second to the third month. On the other hand, Cope (2) has recently called attention to some limitations in the interpretation of pregnandiol excretion, urging that the output may possibly reflect the state of the endometrium in early pregnancy more than the activity of the corpus luteum. He expressed the opinion that the pregnandiol excreted probably represents only a small proportion of the endogenous progesterone, although qualitatively it is an index of corpus luteum activity in either the pregnant or nonpregnant woman. It will be recalled that Hamblen and his co-workers (3) have long stressed the probable role of the endometrium in the fate of progesterone. Cope called attention to the discrepancy between the relatively large amounts of pregnandiol recovered after progesterone injection by Browne, Henry, and Venning (1) and the failure to recover any of the excretion product by Hamblen, Ashley, and Baptist (3) as well as Stover and Pratt (4). Cope's own results were between these extremes and he suggested that still other unknown factors than the endometrium might be involved. If this applies to injected progesterone it is probably true also of endogenous progesterone.

That the corpus luteum hormone is essential to the maintenance of early pregnancy in some animals, such as the rabbit and rat, has been well established. Moreover, Allen and Corner (5) showed that even after early ablation of the ovaries in pregnant rabbits the administration of progesterone will permit pregnancy to continue to term. In other animals, including the primates, the role of the corpus luteum is now known to be not nearly as important. In monkeys Hartman (6) has shown that pregnancy may proceed to term even after early removal of the corpus luteum, and there have been many reports in which human pregnancy was not disturbed by early removal of the corpus. This is not equivalent to saying that the corpus luteum hormone is of no importance, for such is not the case, and abortion is not infrequently the result of early removal of the yellow body. The indication, however, is that the production of progesterone may be taken over early in trophoblastic development. The bearing of this question on the treatment of threatened miscarriage and repeated abortion is manifest, but this will be discussed later.

THE INFLUENCE OF HORMONES ON UTERINE MOTILITY

This subject has provoked innumerable studies during recent years and the results of these are brought together in the recently published book of Reynolds (7). There is almost general agreement that the spontaneous rhythmic contractility of the uterine musculature is dependent upon the follicular hormone, whereas progesterone is an inhibitant of this contractility. From this standpoint the myometrium, therefore, exhibits a definite physiologic cycle paralleling the cycle of the endometrium. On the other hand, a number of workers are in disagreement with these views [Kurzrok, Wiesbader, Mulinos, and Watson (8), Wilson and Kurzrok (9), Wilson (10), and Moir (11)]. For example, the group represented by Wilson and Kurzrok asserted that although, as Knaus (12), Robson (13), and Reynolds believe, the uterus of the rabbit remains quiescent in pregnancy under the influence of progesterone, this is not true of the human. To the contrary, these investigators found that during the follicular phase of the cycle contractions are of small amplitude and short duration, but during the luteal phase they increase in amplitude and duration and decrease in frequency and tonus. With regard to pregnancy, Wilson (10) finds that the human uterus normally contracts in a totally arrhythmic fashion. It should be remembered, however, that during pregnancy another factor becomes operative, that of uterine distention, and Reynolds thought that this had a profound effect upon the contractility of the uterus.

This author sharply criticized the technic employed in the experiments of Kurzrok and his associates, as well as those of Krohn, Lackner, and Soskin (14), and his own studies have led him to believe in the correctness of Knaus' opinion that progesterone is an inhibitor of uterine motility during pregnancy. It is difficult for the clinician to evaluate these differing viewpoints intelligently for himself, based as they are upon technical laboratory methods. It is fair to report, however, that the evidence and opinion of most investigators point to the probable correctness of the Knaus-Reynolds viewpoint.

This question is not without importance in clinical practice, since the assumed quieting effect of progesterone upon uterine motility constitutes at least one reason why this substance has achieved wide usage in the treatment of threatened miscarriage. There are innumerable clinical reports in the literature indicating its value for this condition, though many of them are uncritical and of little scientific value.

As was pointed out in a recent paper by the present author (15), the difficulty in interpreting results lies in the absence of satisfactory controls. The occurrence of uterine bleeding has been the chief criterion in the assumption of threatened abortion but the significance of this symptom is variable. In a large proportion of cases miscarriage does not occur even when no hormone therapy of any kind is employed, so that the benefits of progesterone, when it is resorted to, are difficult to evaluate. This comment is not a criticism of such treatment, which is rational from the standpoint of its effect upon the uterine musculature as well for other reasons, but it is a review of the conclusions drawn by many authors as to percentages of success in the treatment of threatened abortion. This paper is not meant to deal with the therapeutic aspects of the endocrinology of pregnancy, but the above clinical digression will serve to indicate the practical bearing of physiology upon the treatment of certain pregnancy disorders.

THE PROBABLE ROLE OF HORMONES IN THE INITIATION OF LABOR

The bearing of this question of hormonal control of uterine motility upon the problem of the initiation of labor is evident. The determining forces in parturition would seem to be the removal of some inhibiting factors or the addition of positive factors promoting expulsive contractions, or both. Of the first group progesterone would seem to be most important; in the second group the follicular hormone and the oxytocic principle of the posterior lobe of the pituitary gland have suggested themselves to many workers. Robson (16) suggested that the cause of parturition was to be sought in the gradually increasing sensitivity of the uterine muscle to the hormone of the posterior lobe of the pituitary gland as a result of the steadily increasing amount of estrogenic hormone. On the other hand, Heckel and Allen (17) have shown that in the rabbit parturition is delayed by the continued injection of estrogen in the latter part of pregnancy. They found, also, that under these conditions the corpora lutea are maintained and their continued activity is responsible for the delay in parturition. Their experiments led them to conclude that labor occurs because of retrogression of the corpora. It is of interest to note that these authors suggested as a possible cause of the decline of estrogen responsible for the waning of corpus luteum activity the aging process in the placenta which makes it unable to continue the production of estrogen. It will be recalled that one of the old theories before the recognition of hormones attributed the onset of labor to the increasing ischemia resulting from increasing sclerosis of the placental vessels toward the end of gestation.

THE ROLE OF HORMONES IN MAMMARY DEVELOPMENT AND LACTATION

Since the discovery in 1929 of the lactogenic hormone by Stricker and Grueter (18) an enormous amount of investigation has been devoted to the problem of lactation. Although it is universally agreed that this hormone plays an essential part in the phenomenon, the exact mechanism is still far from clear. With regard to the growth of the mammary glands during pregnancy, there is general agreement that the ovarian hormones are responsible. Estrogen has been believed to furnish the hormonal stimulus for the proliferative growth of the duct system, and progesterone for the acinar and lobular development of the breast. However, the mechanism is probably not so simple. For example, Selye (19) has reported that in rats progesterone alone, if given in sufficiently large doses, can produce complete mammary growth. Furthermore, Gomez and Turner (20) have shown that neither estrogen alone nor estrogen plus progestin will stimulate mammary growth in the hypophysectomized rat, whereas material from the anterior lobe of the pituitary gland does induce both duct and lobule-alveolar growth in such an animal. They therefore postulate a pituitary-mammogen theory of mammary gland growth, according to which "estrogen stimulates an increased secretion by the anterior pituitary of a duct-growth factor, while progestin plus estrogen causes an increased secretion of a lobule-alveolar growth factor by the pituitary" (21).

The chief discussion of recent years has revolved about the question of why lactation does not occur during pregnancy and what the factors are which initiate it several days after parturition. According to Turner and Meites (23), four views have been offered by way of explanation: (a) the placenta produces a suppressing agent during pregnancy which holds lactation in check; (b) the mechanical distention of the uterus by the fetus and placenta inhibits lactation; (c) the secretion of progesterone by the corpora lutea suppresses lactation during pregnancy; and (d) during pregnancy the comparatively large amounts of estrogen present in the blood stream inhibit the lactation process.

Until the past few years the theory which apparently was most favored, and is still held by many, was that suggested in 1936 by Nelson (22), who believed that during pregnancy estrogen inhibited the secretion of lactogen by the pituitary gland and that it also exerted an inhibiting effect upon the mammary gland. However, Turner and Meites pointed out that this theory does not explain the occurrence of simultaneous pregnancy and lactation in a number of species, nor does it explain the fact that the augmentation of the lactogen content in the pituitary gland by estrogen injections is experimentally possible in some species. Their own studies have shown that the lactogen content of the pituitary gland remains low throughout pregnancy, but increases from two to four fold following parturition. These findings indicate, they thought, that lactation fails to occur during pregnancy for the reason that the lactogenic hormone is inadequate to support lactation. Some as yet unknown factor is responsible for the increased production of lactogen after parturition.

As evidence to support his theory of lactation Nelson showed that large doses of estrogen are apparently capable of inhibiting lactation in guinea pigs, at least for a time. Other authors reported similar results for other animals [Parkes and Bellerby (24), Robson (16), Reece and Turner (25), and Folley and Kon (26)]. Moreover, many reports have been made to clinicians of the inhibition of lactation by the administration of estrogenic preparations, especially stilbestrol, as well as with androgens [Foss and Phillips (27), Kurzrok and O'Connel (28), Clahr (29), Diddle and Keettel (30), Stewart and Pratt (31), and others]. On the other hand, Smith and Smith (32) reported no significant effect on lactation following the administration of 4000 r. u. of estrogen for six days.

Turner and Meites likewise questioned the validity of reported observations upon humans tending to indicate the inhibition of lactation by estrogens or androgens, one obvious objection being that the infants were taken from the breasts when such therapy was begun, this in itself furnishing an adequate explanation of the cessation of milk production. As further evidence along this line Abarbanel and Goodfriend (33) and later Abarbanel and Klein (34) found that when women were permitted to continue nursing, lactation was not prevented by doses up to 500 mg. of stilbestrol. If even larger amounts, up to 1000 mg., were given in divided doses beginning soon after parturition, lactation was not prevented, though it might be delayed for from two to six days after the last dose of stilbestrol. Similar ineffectiveness for especially large amounts of testosterone propionate, methyl testosterone, anhydro-oxyprogesterone and progesterone have likewise been reported by Abarbanel.

The issue which apparently is involved in this aspect of the problem of lactation would seem to be whether large doses of estrogens or androgens can suppress the lactogenic hormone, as has been suggested by Nelson. Further studies on this point have been reported by Meites and Turner (35). The experiments were done upon rats. Large dosage (2 mg. daily of stilbestrol or testosterone) to lactating rats for the first six days postpartum not only did not decrease the lactogen content in the pituitary gland but actually increased it, although some reduction in the amount of milk present in the mammary gland was noted. Incidentally, parturient rats which were not suckled for the first week showed 50 per cent less lactogen in their pituitary glands than suckled rats, and their mammary glands were practically devoid of milk. This observation, so in accord with everyday obstetric experience, throws a revealing light upon clinical reports as to the value of stilbestrol in the inhibition of lactation when the babies are simultaneously taken from the breast.

In view of the numerous reports now appearing on the use of estrogen in the inhibition of lactation and, more particularly in the relief of so-called painful engorgement of the breast, there may be some confusion in the minds of practitioners because of what has been said here. This confusion is resolved if one remembers that a sharp distinction is to be drawn between painful engorgement of the breast and the onset of lactation. As Abarbanel and Goodfriend (33) remarked, "most of the clinical reports on the effects of estrogens upon lactation in the human have confused painful engorgement with the onset of lactation." With regard to the former condition, clinical reports agree that estrogens and androgens are effective in its relief. Abarbanel and Klein (34), for example, reported that stilbestrol in doses of 25 to 40 mg. prevented painful engorgement in 87.3 per cent of fifty-five nonnursing mothers. In twenty of these some transitory heaviness, usually painless, was noted in twenty cases on the fifth to the eleventh partum days. They stressed the fact that pregnant and puerperal women are extremely tolerant to stilbestrol. Even large doses of from 250 mg. a day to 1500 mg. a week produce no harmful effects, nor does there appear to be any toxic effect even in eclampsia or fulminating toxemia. Other authors who have reported good results with the estrogenic therapy of painful engorgement are Diddle and Keettel (30), Beilly and Solomon (36), and Stewart and Pratt (31).

Although there is still much to be learned as to the factors responsible for the initiation of lactation, there appears to be a much closer approach to general agreement as to those concerned in its continuance. Selye and his co-workers (37) reported in 1934 that the nervous stimulus of suckling was an important factor in the maintenance of lactation once it has been begun, and they offered as the probable mechanism that this stimulus brings about an increase in the lactogen of the pituitary gland. The act of suckling does not appear to be essential for the initiation of lactation, its importance being rather in its later maintenance. This, at any rate, applies to rabbits, which were used in the recently published study of Meites and Turner (38). In this animal it was found that even in the initiation of lactation the act of nursing plays some part since "maximum lactation and maximum lactogen in the pituitary cannot be obtained without it. Furthermore, in the absence of nursing after parturition, the lactogen content of the pituitary declines rapidly and milk secretion soon ceases." This observation in a lower species conforms with the everyday clinical experience of obstetricians with human lactation.

MENSTRUATION AND OVULATION DURING LACTATION

In the past year there have been several efforts at study of the much neglected question of the effect of lactation upon menstruation and ovulation. The fact that pregnancy frequently occurs during the amenorrhea of lactation has generally been explained rather complacently by the statement that ovulation occurs in the absence of menstruation. Such a belief is difficult to reconcile with what is known regarding the sequence of ovulation, corpus luteum maturation and later regression, and then menstrual bleeding. It has therefore seemed more likely that the occurrence of pregnancy during lactation amenorrhea indicates merely the fertilization of an egg from a first ovulation, and that if the fertilization had not supervened the ovulation would have been followed by menstruation.

Support has been given to this belief by the recently published study of Topkins (39) based on endometrial biopsies during the period of lactation. The study embraced 145 biopsies from twenty-eight women, at least four biopsy specimens being obtained from each woman, including the time span between six weeks and thirty-one weeks postpartum.

Of the 145 specimens, 136 (94 per cent) showed an estrogenic endometrium, and twenty of these (15 per cent) showed evidence of hypoplasia. In only nine specimens (6 per cent) were progestational changes found and all of these were associated with the onset of the first menstrual period. The author concludes that "the endometrium during the period of lactation amenorrhea is similar to that found in amenorrhea caused by other factors; it shows diminished estrogenic stimulation." He believes that the suppression of the cycle in women with lactation amenorrhea is complete, whereas in those who menstruate it is incomplete. This latter statement agrees with the findings of Lass, Smelser, and Kurzrok (40) based on the study of biopsies on forty-seven women through their postpartum period. These women exhibited 194 fairly regular cycles, of which 106 (55 per cent) were anovulatory or sterile in character, and eighty-two (45 per cent) cycles were ovulatory in character. Finally, reference may be made also to the report of Griffith and McBride (41), who in a biopsy study of twenty-one normal lactating women at intervals of from three to twenty-four weeks postpartum found that only one woman had ovulated prior to the reestablishment of menstruation.

The hormonal mechanism by which the cycle is inhibited during lactation is still a matter of conjecture, as Topkins discusses in his paper. The immediate factor is undoubtedly a suppression of the pituitary gonadotropes, but whether this is caused by the lactogenic hormone or by some as yet unknown internal secretion of the lactating breast cannot be determined.

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THE COMPRESSION TREATMENT OF BURNS*†

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The work of Davidson (5, 6, 7) began a new era in the treatment of burns. His doctrines were: general treatment of the patient, cleansing of the burned area, closing of the burned area from further contamination, the prevention of fluid loss, and the fixing of toxins. Tannic acid was used to avoid contamination and fluid loss, as well as to fix toxins. With the application of these principles the mortality of burned patients was reduced greatly. The toxic theory has been challenged but not disproved. Improvements in Davidson's methods have been made, yet basically the doctrines remain intact.

Underhill (15, 16), Blalock (4), and Harkins (9) made outstanding contributions to the general care of the burned patient, namely, in the treatment of shock.

There is almost universal agreement upon the necessity of turning the burned area into a sterile field by debridement and cleansing methods. There is some difference of opinion concerning the need or advisability of using a general anesthetic for this purpose.

Many new and different types of chemicals and other substances have been advocated for topical application to the burned area. Harkins (10) reported seventy-five different methods. It is well to recognize that these numerous new remedies in no way attack the principles of Davidson; they merely replace the use of tannic acid. Some of the new chemicals have distinct advantages over tannic acid. However, it should be recognized that no topical application of any substance, except new skin, will replace the destroyed skin of a third degree burn. Nevertheless, if all the accepted principles of treatment are carefully adhered to, good results will be obtained with practically any of the chemicals or substances recommended for topical application so long as the burn is of only first or second degree.

Mason (13) has recognized and accepted all these conditions and has by the use of compression bandages greatly reduced the fluid loss of the patient, especially the fluid lost into the tissues. The compression bandage definitely aids in the control of shock and likewise makes it easier to maintain the normal protein level of the blood, thus helping the general treatment of the patient. Most of the different types of local treatment applied to the burned areas at least imply leaving the areas undisturbed for about two weeks in order to permit the skin to heal. This is also advised with the compression treatment.

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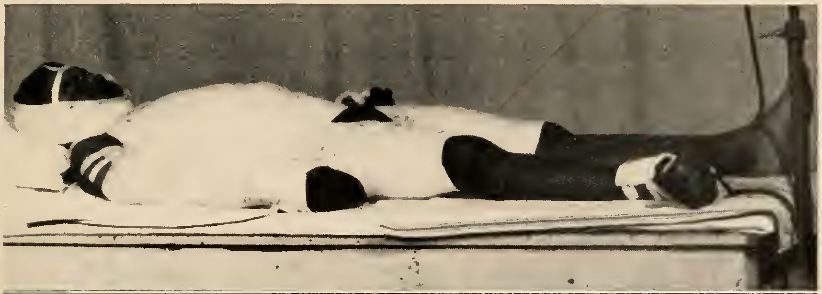
† Read at the Annual Meeting of the Medical and Chirurgical Faculty, April 28, 1943.



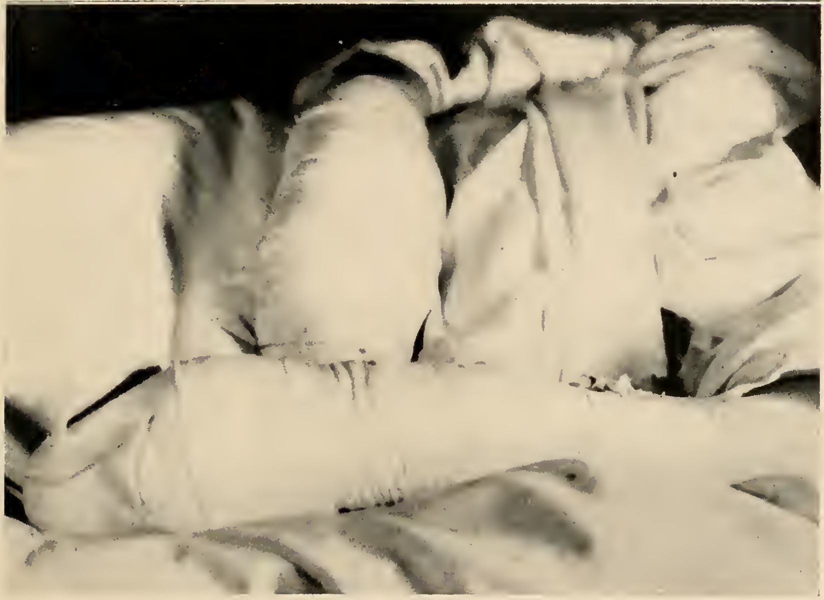


Fig. 1. (Upper) The appearance of a burned patient twenty-four hours after the application of compression bandages. These bandages will not be disturbed for ten to fourteen days.

Fig. 2. (Lower) Compression bandages applied to burned hands where they have been found effective.

A MODIFIED TECHNIC OF COMPRESSION TREATMENT

The burned patient is protected from further injury and especially from bacterial contamination. The personnel working around the patient is masked and treatment is best carried out in the operating room or in a special room provided for this purpose.

Immediately upon arrival the patient receives adequate morphine. Blood is taken for analysis and intravenous plasma is given. The quantity of plasma and the length of time it is administered will depend upon the patient's condition. The temperature of the room should be maintained at about 80 F. The best treatment for shock is prophylactic treatment.

As soon as the condition of the patient is understood and shock has been controlled or prevented the burned area is cleaned and debrided, with or without a general anesthetic. The burned area must be cleansed without causing further injury and this is usually accomplished by soap and water, using gauze and not a brush. One must judge from the individual patient which will contribute the most to produce shock, the general anesthetic or the pain incident to cleansing without an anesthetic. In most cases a better sterilization of the burned area can be accomplished by the use of general anesthesia.

The cleaned burned area is covered with gauze impregnated with xeroform ointment, although other topical applications may be used. A generous covering of gauze or sterile mechanics' waste is next applied and the area is wrapped tightly with gauze bandage reinforced by a covering of elastic adhesive tape which maintains pressure on the burned area.

The patient is taken to the ward or his room and the treatment of shock is continued by accepted methods. The diet, vitamins, and minerals are maintained adequately. The patient is given generous amounts of whole blood at short intervals. He should also receive quantities of sodium bicarbonate from the beginning of the treatment in order to avoid anuria.

To this point burns of all degrees are treated alike; however, subsequent treatment will depend upon the degree of the burns. Those of first and second degree are redressed at the end of fourteen days and if no infection has occurred the burned areas will be healed. Burns of third degree are undisturbed for ten to fourteen days. Preparation is then made for redressing under a general anesthetic, at which time debridement and skin grafting are done. The extent of debridement and grafting is determined by the individual problem. Subsequent dressings are applied at weekly intervals until all areas have been debrided and grafted. When grafting has been completed anesthesia is no longer needed for redressing. Severely burned patients thus treated maintain a high morale. Burns of mixed degrees are treated by the plan outlined for third degree burns.

It is desirable that the treatment of third degree burns be set entirely apart from that of first and second degree. If infection is prevented in first and second degree burns the burned area will heal. Any of the recognized topical medications applied to a cleaned first or second degree burned area will prove highly satisfactory so long as the general principles of burn treatment are practiced. In a burn of third degree not only must infection be prevented, but the destroyed skin must be removed and replaced from some unburned skin area of the patient. Too often the destroyed skin is removed by sloughing, which is actually allowing bacteria to accomplish a task best done aseptically by the surgeon. When dead skin is removed by bacteria, infection must be controlled by the formation of granulation tissue which in the end becomes dense fibrous or scar tissue. Thus, the burned area is covered first by scar tissue and then by skin grafting. The results are contractures and the formation of poor epithelium. The epithelium often is not resistive to trauma because its blood supply is limited by the underlying layer of scar tissue.

The ideal treatment for a third degree burn has not been perfected, whereas first and second degree burns are treated adequately. Often it is difficult, if not impossible, to judge a burn that has destroyed the full thickness of the skin. It has been reported by Kitlowski (11) that hydrogen peroxide will not foam when applied to such an area. Leitch (12) has suggested that oozing will not occur in cleansing a burn of third degree. Eschars that remain fixed more than three weeks (7) denote an area of third degree burn, but this does not give immediate help in the determination of the burn depth. Of course, most extensive burns include areas of all three degrees. The existence of this practical fact should not confuse the fundamental differences in the character of the burned areas.

If the extent of the third degree burn can be recognized, a definite area can be excised surgically and the grafting accomplished either by split skin or by small deep grafts before infection occurs and before granulation tissue appears. The size of the burn and the condition of the patient may not warrant this procedure as an initial treatment. However, at successive weekly intervals areas of third degree burn can be excised and grafted until all areas have been covered by grafted skin. The magnitude of each procedure will depend upon the area of burn and the general condition of the patient.

In order to carry out such a routine the patient must be maintained in the best possible state of health. The hemoglobin content of the blood can be kept at between 80 to 90 per cent if sufficient whole blood can be given. The diet, vitamins, and minerals must be maintained adequately.

It is rather meaningless to compare the mortality rates and end results of various methods of treatment because too many variable factors are present. An individual suffering from carcinoma of the stomach with metastasis will not tolerate the same severity of burn as an individual of the same age in good health. A patient eight months of age, one eight years old and another eighty years of age will not withstand a burn of comparable degree and extent in the same manner. The mechanical factors of moving, dressing and nursing patients definitely influence the prognosis. A fifty pound child can be moved and dressed in almost any manner with ease, whereas the

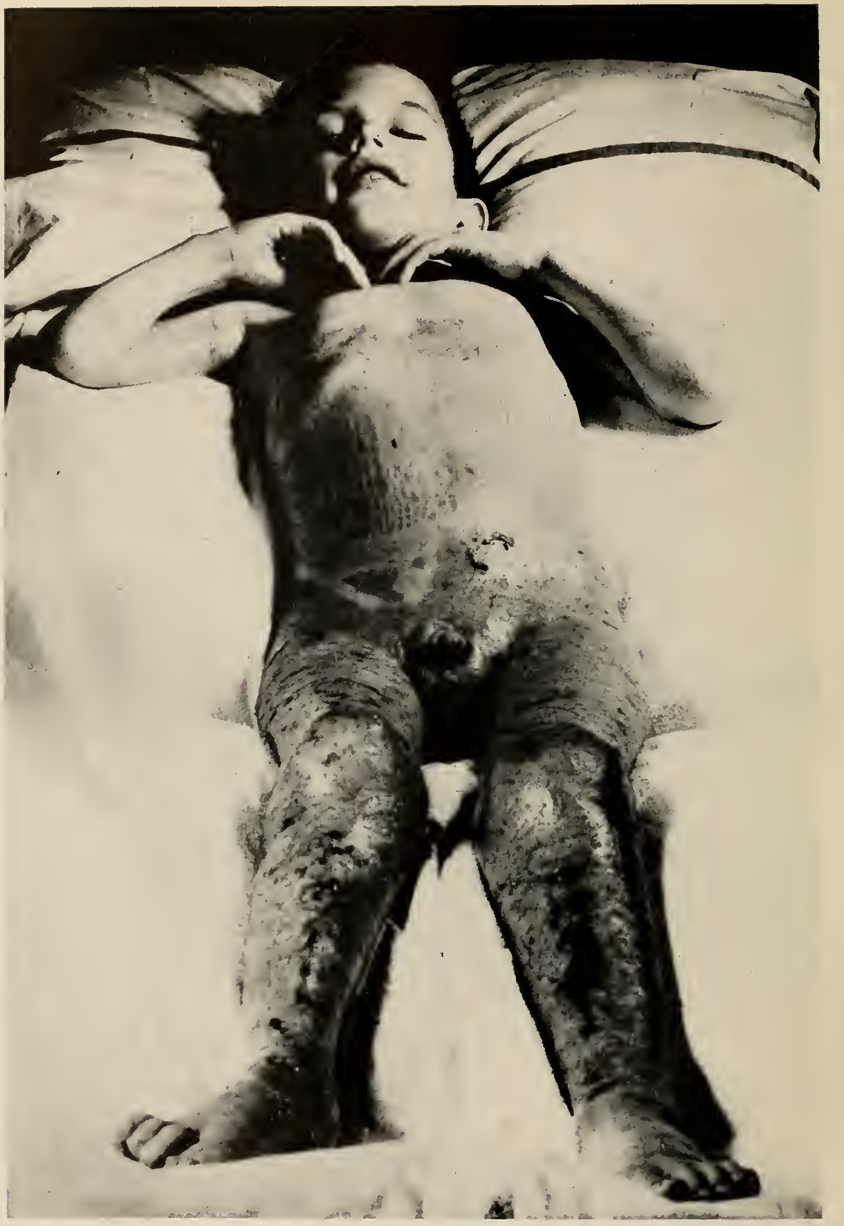


FIG. 3A

FIGS. 3A AND 3B. These are photographs of a burned patient treated by the compression method. There was a total area of 55 to 65 per cent of body surface burned, of which the third degree area approached 45 per cent. The third degree area was complete from the crest of the ilia to the malleoli over both lower extremities, and there was also a large third degree burned area on the back. The last skin grafting was done on the sixtieth day after the burn. The photographs were taken on the ninety-first day after the burn.

treatment of an adult weighing 350 pounds is extremely difficult from the purely mechanical point of view. The quantity of plasma and whole blood available for each individual patient is an important factor. The interval of time before treatment is instituted, the cleanliness of the skin before the burn, the cooperation of the patient, and innumerable other circumstances

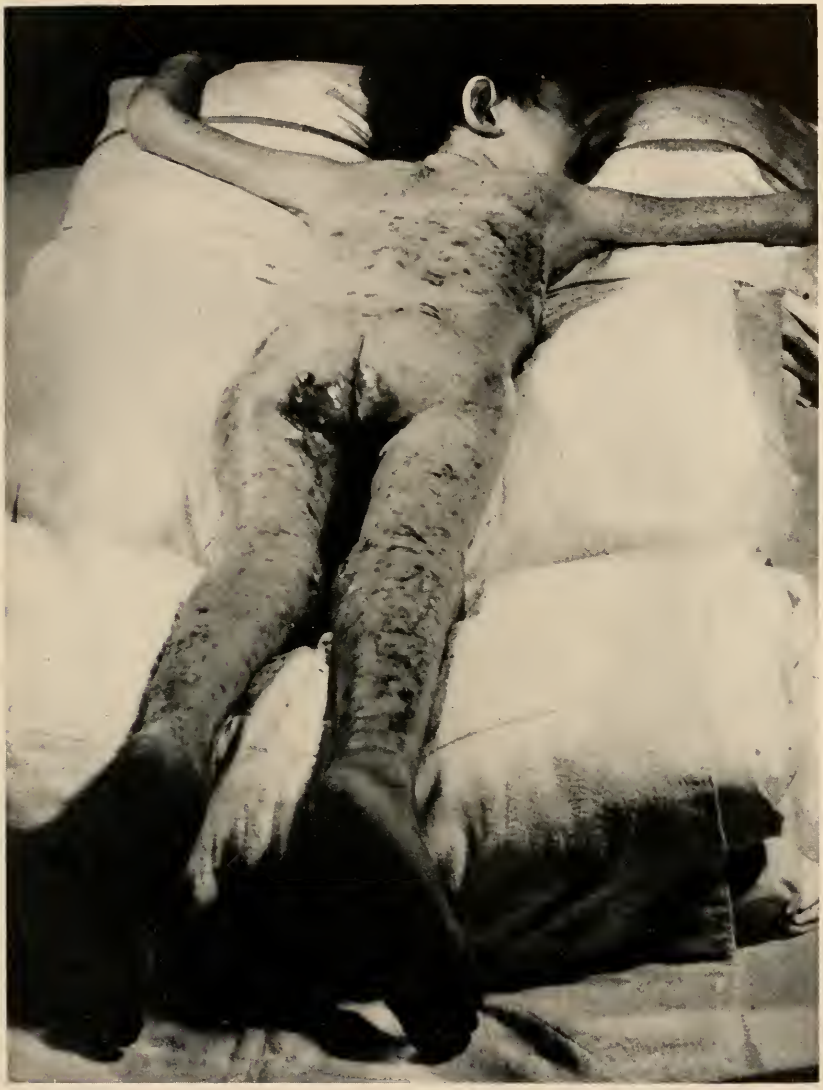


Fig. 3B

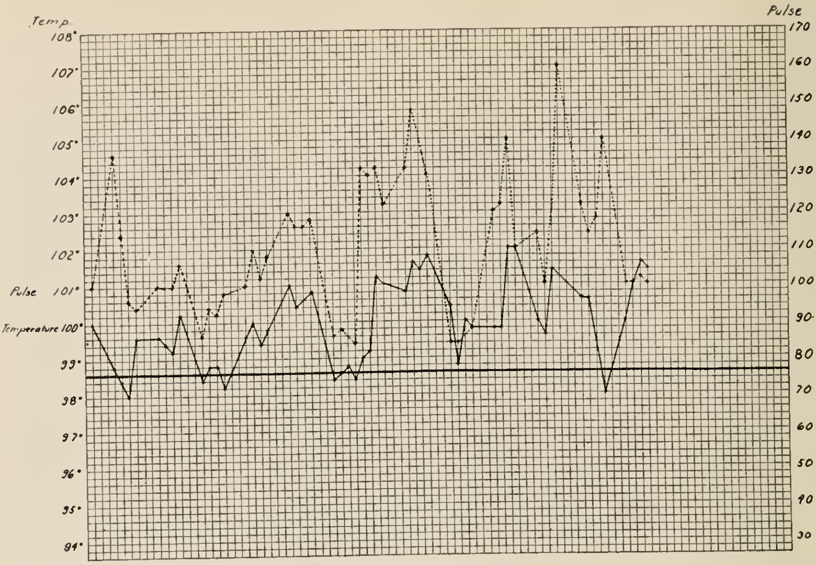


FIG. 4. The temperature and pulse rate of the burned patient seen in Fig. 3 for the first two weeks.

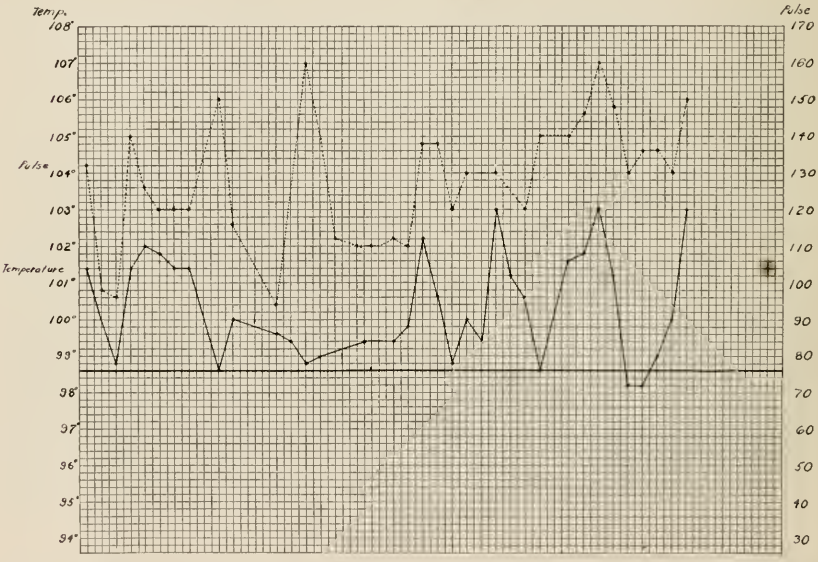


FIG. 5. The temperature and pulse rate of the patient seen in Fig. 3 from about the fiftieth to the fifty-sixth day after the burn. This was the child's most critical period.

influence the mortality and end results probably much more than a definite type of treatment if that particular treatment is carried out properly.

Willems and Kuhn (17) reported a series of 1206 burn cases with a mortality of 1 per cent. The authors have not been able to even approach this figure by any method of treatment. Hamilton (8), on the other hand, had no survivals where second and third degree burns exceeded 31 per cent of body surface. He found that a third degree burn of 10 per cent of body surface is an extremely grave condition. The authors have used tannic acid, tannic acid and silver nitrate (3), gentian violet (1), triple dye (2), and sulfadiazine in triethenolanine (14) in the treatment of burns of all degrees. Tannic acid with silver nitrate formerly was the method most desirable because it permitted the cleaned burned area to be closed from further contamination in a matter of minutes. Since using the compression method of treatment on forty burned patients requiring hospital admission it has become the method of choice. This permits immediate protection of the burned areas from further contamination and injury; it makes the control of shock easier; the blood proteins can be maintained easier; less after-care is required; no eschar or coating agent need be removed; and skin grafting can be done earlier.

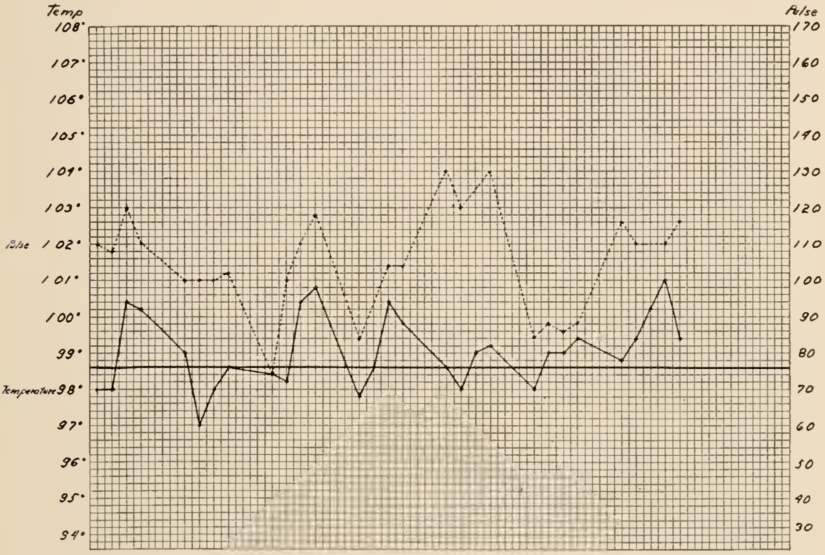


FIG. 6. The temperature and pulse rate of the child seen in Fig. 3 from the eighty-fifth to the ninety-first day after the burn.

CONCLUSIONS

1. The general principles in the treatment of burns as outlined by Davidson are still effective.

2. Burns of third degree must be considered and treated differently from burns of first and second degree.

3. Any recognized topical medication when applied to a cleaned first or second degree burned area will be highly effective if other principles of treatment are observed.

4. No topical application of chemicals or substances will replace the destroyed skin of a third degree burn.

5. Skin grafting should be done before granulation tissue develops.

6. The compression method of treatment for burns has been found highly satisfactory. It permits easier control of shock, requires less after-care, and skin can be grafted earlier.

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A REPORT OF A SERIES OF CASES OF CARCINOMA OF THE PROSTATE GLAND WITH SPECIAL REFERENCE TO THE IMPORTANCE OF "ACID" PHOSPHATASE DETERMINATION AND CASTRATION AS A MEANS TO CONTROL THE MALIGNANCY* †

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Huggins, in his classical experiments on isolated dog prostates, demonstrated that the increased serum "acid" phosphatase could be reduced promptly by castration and further increased by injection of androgenic substances. This determination of serum "acid" phosphatase is now widely used for the diagnosis of metastasizing prostatic carcinoma. Still earlier, in 1935, Kutscher and Wolbergs (10) showed that the prostate gland contained a phosphatase with maximum activity in acid solution. A year later Gutman and Gutman (7) found that bone which was the seat of metastatic lesions from carcinoma of the prostate contained this "acid" phosphatase as well as the usual bone alkaline phosphatase. Later in the same year they showed that the prostate gland of infants contained almost no "acid" phosphatase, but subsequently as puberty developed there was a definite increase which was found in still larger amounts in benign hypertrophy of the gland and even in far greater quantities in the malignant state.

The term "acid" phosphatase is given to designate that particular enzyme which has the property of splitting organic phosphorous compounds into ions in acid media. In this series of twelve cases, the authors have followed the routine of obtaining "acid" phosphatase determinations on suspected cases of prostatic malignancy and have also checked the determinations after bilateral orchidectomy in order to assay the value of the test. Although it should be realized that in this small series of cases over the course of about one year inadequate statistical analysis and insufficient time were available from which to draw any direct conclusions that would formulate definite and fixed evaluation of the procedure, the investigation is set down here as a step toward more desired goals in the future.

Formerly carcinoma of the prostate was considered a rare disease. Even as recently as 1888 Engelbach could collect only 114 reported cases of malignant tumors of the prostate gland. However, as the life span has increased there has been an increasingly greater number of cases reported. In previous years diseases such as pneumonia, tuberculosis, cardiovascular renal

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growth had a chance to take control. With the advent of sulfanilamide and its derivatives and improved therapy along other lines the clinical entity of a malignant prostate is forging ahead as a serious disease with which the general practitioner and the urologist must contend. It is of interest to note that in this series of twelve patients four were being treated for heart conditions and one for diabetes when their symptoms of prostatism got the upper hand.

It has been estimated that 30 per cent of all men over sixty years of age will show clinical prostate enlargement and that 15 per cent of this group has prostatic malignancy. In the series herewith reported the average age was sixty-eight years, the oldest being eighty; the youngest was fifty-two years old. Seventy-five per cent of the patients showed signs of urinary obstruction on admission. In all cases urinary symptoms were present, bleeding being the most important symptom in five of the twelve cases. Five of these patients were suffering from characteristic intractable pain. All compared the pain to a burning flame or poker in their hip region or between the shoulders. In only three cases was the use of stilbestrol found advisable. In the first case it is questionable whether it was of any significance. The second case proved sensitive to the drug and it was necessary to discontinue it. The results from the third case studied have not been obtained because the treatment is still in progress.

To the average doctor the subject of "acid" phosphatase determination is still in its incipient stage. It might be of importance to digress here and explain the meaning and clinical significance of the test. It has been stated previously that "acid" phosphatases are dephosphorlating enzymes which possess the ability to split organic phosphoric esters at a pH 5 optimum. Human prostate tissue contains anywhere from 500 to 2000 units by the Bodansky method. It is believed by Huggins and others that this "acid" phosphatase is elaborated by prostatic epithelium.

Normally the enzyme is excreted as a part of the prostatic fluid in the ejaculate. The entire basis of the test for metastasizing carcinoma of the prostate is essentially this: when malignant tissue reaches bone the infiltrating epithelial cells continue to grow and elaborate the enzyme phosphatase. Ewing (6) in his incomparable book on neoplastic diseases has pointed out that the most common cause for metastatic growth in bone is prostatic carcinoma.

The method of determination used in these cases was according to the Bodansky technic. In all of these cases the test was found to be positive in carcinoma. Formerly the most reliable basis for the diagnosis of carcinoma of the prostate gland was by a rectal examination and biopsy. The usual procedure here is first to do the rectal examination; an "acid" phosphatase test is made even if the gland does not show the three cardinal signs of prostatic malignancy, namely, nodularity, inelasticity, and stony hardness. If the serum "acid" phosphatase is increased, a roentgenograph is obtained for evidence of metastases. It has been the practice in this series to consider anything over 3 units of "acid" phosphatase as suggestive of prostatic malignancy. Herger and Sauer give 4 units as the line of demarcation. The procedure here is to repeat the test at least once, if a value of 3 or slightly more is obtained, and twice if malignancy is strongly suspected. In the present series the "acid" phosphatase readings varied from the highest of 35 to the lowest of 4.2 units, with an average of 12.2. Hence, it was found that 100 per cent of the cases had an "acid" phosphatase greater than 4 units. The value of a roentgenograph of the bones has proved of little use in this series. Only two of the twelve cases showed any diagnostic evidence of metastatic lesions.

Gutman and Gutman (7) have presented a most important finding by illustrating cases with extremely anaplastic tumors which failed to show any increased "acid" phosphatase. It is likely that since secretion of the enzyme is peculiar to the prostatic epithelium, anaplastic tumors of undifferentiated cells may not be associated with enzyme levels above 3 or 4 units. It must also be taken into account that a prostate may on digital examination present all the evidence of malignant growth and still the laboratory enzyme report will be below 3 units because the tumor has not had time to metastasize.

In view of the interesting symptoms presented in these cases and the correlation of these symptoms with "acid" phosphatase records and clinical results, nine of the cases in this series are summarized briefly.

CASE REPORTS

Case No. 1: L. C., 52 years old, was first seen on December 29, 1942. He was admitted with the complaint of loss of weight, weakness of the lower extremities, chiefly the left, constipation, difficult urination, and burning in the left testicle and hip region. He had lost about twenty-five pounds in four months. The weakness of his lower extremities was so great that he finally had to use a cane. His family and past histories were noncontributory.

A physical examination showed a thin, undernourished male of 52 years in no apparent distress. The neurologic examination revealed a generalized motor weakness in his lower extremities. It was most noticeable, however, in the left thigh and left leg. His reflexes were hyperactive. The vibratory sense was impaired over the right lower extremity. Hyperesthesia was present over both lower extremities, with no loss of position sense. The blood pressure was 115 mm. of mercury systolic and 80 mm. diastolic. All other findings were negative, except for the rectal examination. This showed a prostate that was symmetrically enlarged, fixed, and moderately tender, with a right lateral lobe presenting a hard nodule. The sphincter was of good tone. A roentgen ray examination revealed metastatic prostatic malignancy involving the pelvic girdle and the fifth lumbar vertebra.

On January 6, 1943 the acid phosphatase determination was 31.1 and a surgical operation was advised. The usual procedure was followed. The testicles were separated from the overlying tissues, a clamp was put on at the entrances of the vas, the tunica was sutured around the end of the vas, and the remnant placed in the scrotal sac.

His phosphatase report showed 32.9 units on January 17, 1943. The patient was subsequently discharged on that date and was feeling much better. The motor weakness had disappeared and his condition improved to the extent that he could resume his former work as a farmer. One mg. of stilbestrol was given three times a day as a supplementary treatment.

Case No. 2: J. W., a 75 year old male, was admitted to the hospital on February 2, 1942 with the complaint of hematuria of two weeks' duration. In 1935 he first noticed symptoms of hematuria, frequency, burning, dribbling, and latency of the stream. In 1937 a suprapubic prostatectomy was done. On September 20, 1941 he had an attack of acute retention for which it was necessary to do a suprapubic cystotomy and resection. Afterward he felt well and did not lose weight. The urinary symptoms improved to the point where his only complaint was nocturia two or three times a night; two weeks before admission he again began to bleed.

An examination on February 2, 1942 revealed a well developed, elderly male. His heart was markedly enlarged to the left, with a blood pressure of 200 mm. of mercury systolic and 100 mm. diastolic. Examination of the abdomen was negative. A rectal examination showed the prostate to be hard and nodular, with no tenderness. The sphincter tone was moderate.

A roentgenograph revealed no evidence of metastatic spread. The acid phosphatase determination was 5.7 units. On February 11, 1942 a bilateral orchidectomy was done in the usual way. Eleven days later the patient was discharged in good condition and his only symptom was nocturia once or twice a night.

Case No. 3: J. S., a 71 year old white male, was admitted to the hospital on February 13, 1942 with the complaint of difficulty in voiding. He had been entirely asymptomatic as far as urinary complaints were concerned, with the exception of mild frequency and nocturia, until several days before admission. Then he began to dribble and developed acute retention. He was catheterized on February 13, 1942 and passed a small amount of blood.

An examination revealed a well developed and well nourished white male in no acute distress or pain. His liver edge was two or three fingers below the intercostal margin. The blood pressure was 106 mm. of mercury systolic and 60 mm. diastolic.

Upon rectal examination the sphincter tone was found to be poor. The prostate was enlarged, especially the right lobe, which was hard and nodular.

A roentgen ray examination showed no evidence of metastasis. On February 18, 1942 a transurethral resection was done and this was followed nine days later by an orchidectomy because the pathologic report had verified the diagnosis of carcinoma of the prostate. No acid phosphatase was reported on this patient. He was discharged on March 3, 1942 in fairly good condition.

Case No. 4: T. B., 61 years old, white, male, was admitted to the hospital on March 14, 1942 with the complaint of pain in the left hip and hiccoughs for four days. In 1941 a transurethral resection had been done for a urinary obstruction. The pathologist made a diagnosis of adenocarcinoma. A roentgen ray examination for metastasis was negative.

After his discharge on December 25, 1941 he felt much better and had no urinary difficulties until about March 2, 1942. A pain of the dull, boring type began when he moved his left hip. It was also present when he did not move his hip and seemed to be all along the distribution of his left sciatic nerve and in the region of both ischial tuberosities.

A physical examination revealed a well developed white man of 61 years in no acute distress but hiccoughing constantly. The abdomen was distended. His blood pressure was 135 mm. of mercury systolic and 85 mm. diastolic. A roentgenogram showed no evidence of metastatic malignancy. An acid phosphatase determination was not done. A bilateral orchidectomy was performed in March, 1942 on the basis of the pathologic report in 1941. He was symptom-free until his admission on February 6, 1943, when he had severe pain in the right thigh and leg.

Case No. 5: J. W., a 62 year old white male, was first seen on June 8, 1942. At that time he complained of excruciating pain in his hips and down along the inner aspect of his legs. He had symptoms of frequency, urgency, and dribbling of about two years' duration. The past history was noncontributory.

All findings were negative except for the rectal examination. The prostate was enlarged and encroached considerably upon the ampulla. There was almost complete fixation and nodularity both on the right and left lobes. The roentgen ray examination at this time showed questionable metastases to the hip bones. The acid phosphatase test showed 12 units.

On June 10, 1942 a bilateral castration was done under spinal anesthesia. In twenty-four hours the patient was asymptomatic as far as pain was concerned. He was discharged eight days later and has not complained since.

Case No. 6: D. R., 64 years old, white, male, was first seen on June 23, 1942 because of excruciating pain in his shoulders and breast. The family history was noncontributory. His past history was significant in that two months before admission he had been discharged from a hospital because of a displaced third dorsal vertebra for which he had received treatment.

He first noticed his symptoms in November, 1941 when he had acute pain in his shoulders. He attributed this to a heavy overcoat he was wearing. The pain eased somewhat but returned in December. By January it became a pronounced pain that was present only occasionally. Three weeks before admission to the hospital the pain became more severe and constant in nature. The pain felt "as if a burning poker was between his shoulder blades." It was much greater at night and the patient could not sleep.

A physical examination was noncontributory, except for a moderately enlarged prostate and a stony hard nodule in the left lobe. A roentgen ray examination on June 23, 1942 showed no evidence of metastases. The acid phosphatase report was 7.4 units.

A bilateral orchidectomy was done under spinal anesthesia on June 24, 1942. This case was noteworthy because twenty-four hours after the operation the patient was entirely free of pain. He was discharged on July 1, 1942 and there has been no return of the symptoms.

Case No. 7: W. G., a 55 year old white male, was first seen on August 9, 1942. He came to the hospital with a history of pain in his rectum and hips, some dysuria, frequency and urgency for the last seven years. About one year previous to admission he began to notice pain in his perineum, but in the two months before admission it had spread to the hips. He said the pain "was just like a burning poker which made him feel as if his rectum would burst."

A physical examination showed a well developed man of 55 years. The findings were negative, except for the rectal examination. The prostate was huge, almost filling the ampulla. It was hard, nodular, tender, and almost immovable. A roentgen ray examination revealed evidence of metastases to the hip bones. The acid phosphatase determination showed 8.6 units.

A bilateral orchidectomy was performed under spinal anesthesia on August 10, 1942. The next day the patient was completely free of pain. He had no complications and was discharged on August 18, 1942. He is now continuing his work as a taxi driver.

Case No. 8: H. K., 70 years old, white, male, was first seen on July 14, 1942. He presented a complaint of severe pains in his hips and shoulders "like a flame was burning there." About two weeks prior to admission he began to bleed from the penis. The pain began first in the heels, spread up the spine, and then progressed to his shoulders. In the words of the patient, "it felt as if he had a red hot poker for a spine and could not get it out."

The physical findings were negative, except for the rectal examination which showed a nodular, slightly elastic, tender gland of moderate enlargement. A neurologic consultation at the time showed that the patient had a clinical incomplete transection of the cord because of a metastatic nodule. A roentgenogram showed metastases to the lumbar and dorsal vertebrae and infiltration of the left lung. The acid phosphatase report was 11 units.

A bilateral orchidectomy was performed on July 17, 1942. This case was especially interesting because most of the pain subsided after the operation. The postoperative course was marked by a spiking fever. In this patient it was decided to supplement the treatment with stilbestrol, but he showed a toxic reaction and it was discontinued. He was discharged on September 14, 1942 free of pain and with an almost complete return of the ability to use his legs.

Case No. 9: A. N., a 70 year old white man, was first seen on January 29, 1943. At that time he complained of hematuria of two weeks' duration. Five years previously he had a suprapubic prostatectomy and since that time had no trouble until two weeks before the admission date, when he began to bleed.

All findings were negative, except for the rectal examination. The recurrent prostatic growth was large and tender. There were nodules which were hard and fixed, both in the right lobe and in the midline. A roentgen ray examination showed no evidence of metastases. The acid phosphatase report showed 12 units.

On February 1, 1943 the usual orchidectomy was done under spinal anesthesia and the postoperative course was uneventful. An acid phosphatase reading on February 5, 1943 showed 7 units. The patient was symptom-free when discharged on February 10, 1943.

THE EVALUATION OF SERUM ACID PHOSPHATASE DETERMINATIONS WITH FOLLOW-UP CASTRATION

In seven of the twelve cases in this series the follow-up has shown that the "acid" phosphatase determination was unmistakably correct.

1. In five of the cases in which the patients came with the complaint of excruciating pain the serum "acid" phosphatase determinations have been well above 4 units. Subsequent castration in all five cases has given complete relief in four of these cases and considerable alleviation in the other, with still further improvement to be expected in the future.
2. Two of the cases, notably Nos. 8 and 9, showed a decrease in "acid" phosphatase from 11 and 12 respectively to 7 units in both cases. In each instance this value of 7 units was obtained at the end of hospital convalescence for the operation of bilateral orchidectomy.
3. In Case No. 4, where a bilateral orchidectomy was done in March of 1942, the patient came back to the hospital on February 6, 1943 with the complaint of recurrence of pain in his right leg. Because of the history of carcinoma an "acid" phosphatase determination was made and a reading of

35 units was reported. Since the "acid" phosphatase had not been determined when the orchidectomy was performed, one cannot tell whether it decreased or increased. However, because the reading was high it can be concluded that perhaps the operation has only slowed up the metastatic spread which now is gathering new momentum. The patient was discharged and sufficient doses of stilbestrol were prescribed to help him if possible. Clinically, except for the pain in his leg, he is greatly improved and his weight has increased about 100 pounds.

4. The remaining four patients, because they presented no clinical evidence of malignant spread and because their residence is so distant that a check of serum "acid" phosphatase would at this time necessitate much expense and loss of time, cannot be evaluated along these lines. However, the urinary symptoms have cleared up in each instance.

5. In this series, where clinical and laboratory reports clearly showed metastases in seven cases, the roentgenograms have been discouraging since they show roentgenologic diagnostic evidence of malignant spread in only two cases, one of which was questionable.

6. All of these patients, who prior to operation reported gross hematuria, partial paralysis, intractable pain, great loss of weight and nocturia, have without exception shown definite alleviation of their symptoms.

7. Tolson (12) has written upon the effects of mutilation from bilateral orchidectomy. In this series of twelve cases none of the patients has shown any symptoms of a troubled mental state over the loss of the testicles. As a matter of fact, two of the patients did not believe that an organ had been removed. Therefore, it has not been necessary to replace the testicles with plastic parts to control mental embarrassment.

8. In all twelve cases subsequent rectal examination has shown from slight to marked regression of size and hardness of the gland.

SUMMARY

It should be realized that the series is too small and the time too short to draw any definite conclusions. However, all of the twelve patients were definitely improved. In none of the cases has a cure been established; nevertheless a definite "salvage" has been obtained, especially in the five cases suffering such excruciating pain.

If for no other reasons than those mentioned, bilateral orchidectomy as a treatment of metastasizing carcinoma of the prostate should be done in 100 per cent of the cases if these twelve case reports represent a fair index, which the authors certainly believe.

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PROCEEDINGS

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ONE HUNDRED AND TWENTY-SEVENTH PROGRAM MEETING

The One Hundred and Twenty-Seventh Program Meeting was held on April 21, 1943 at 4:00 P.M. in the Bressler Lecture Hall.

The following program was presented:

"Haploids in Peppers," by Dr. Ronald Bamford, Department of Botany, University of Maryland, College Park.

"A Preliminary Report of the Blood Picture in the Monkey, with Especial Reference to the Life Duration of the Red Blood Cell," by Mr. O. G. Harne, Dr. John F. Lutz, and Dr. Carl L. Davis, Department of Histology, School of Medicine, University of Maryland.

Abstracts of these papers follow.

HAPLOIDS IN PEPPERS

Hilde M. Christensen and Ronald Bamford, Ph.D.*

The investigation reported concerned the occurrence of haploids among nearly 200 twin seedlings of *Capsicum annuum* L. Seven haploids were found. Two of them originated from one variety, World Beater, and when meiosis was observed the association of the chromosomes indicated a different genetic makeup in each. Meiosis was studied in all haploids and the potential role of this type of plant in a breeding program was demonstrated.

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[*] From the Department of Botany, University of Maryland, College Park.

A PRELIMINARY REPORT OF THE BLOOD PICTURE IN THE MONKEY, WITH ESPECIAL REFERENCE TO THE LIFE DURATION OF THE RED BLOOD CELL*

O. G. Harne, John F. Lutz, M.D., and Carl L. Davis, M.D.†

The life duration of the red blood cell of the monkey (Macacus rhesus) has been studied by the same technic as that used for determining the life span of the red blood cell of the rabbit (1) and rat (2), that is, the animals were subjected to acute hemorrhage and daily records made of the ensuing blood picture. It was reasoned that when large numbers of red cells are removed from the animal by sudden hemorrhage or blood letting, the lost blood cells will be replaced promptly by an approximately equal number of young cells from the bone marrow. Such young red blood cells are termed reticulocytes. By supravital staining methods these reticulocytes can be identified and counted, thus making it possible to show the degree of reticulate reaction and hence the extent of the red cell replacement. It is obvious that when a population of circulating red cells is depleted abruptly, as by hemorrhage, and a new population of young cells replaces those lost, there will exist in the blood stream a definite block of red cells of approximately the same age. Therefore, if the red blood cells all have about the same life span such a large block of cells should go on together through their period of activity in the body to final senescence, at which time they should be destroyed or withdrawn from the circulation en masse and replaced by a second new population of young cells. Such a replacement may be referred to as a spontaneous reaction. At this time these young cells can be detected by their staining characteristics and the extent of this replacement evaluated. The time lapse between the original replacement following the hemorrhage and the subsequent replacement following the senescence and withdrawal of these cells from the circulation should express the life tenure of this block of cells. Actually, this sequence of events has been demonstrated for the rabbit and the rat, and evidence is now at hand indicating that it holds also for the monkey.

A series of twenty experiments was conducted upon ten monkeys to establish the life duration of the red blood cell in these animals. It was found that all the animals responded to hemorrhage in the usual manner. The normal or control level of reticulocytes, young red blood cells, was found to vary among these animals between the narrow limit of 1.1 to 1.6 per cent of the total red blood count. The latent period of reaction to hemorrhage is fairly constant and covers a span of between forty-eight and seventy-two hours. The peak reaction following hemorrhage rose to as much as 500 per cent above control level, whereas the spontaneous reactions reached levels of 300 per cent above normal. In every case the reticulocyte count dropped down to or below control level between reactions.

As the control level of the reticulocyte was found to vary among monkeys, so also does the life span of the red cell. The life span, however, is constant for the individual. The low and high life spans as found in these animals were eighty-nine and a hundred and twelve days, respectively. The average for all animals studied was one hundred days.

In addition to data dealing with the life span of the red cell, much collateral information is at hand and it should be pointed out here that reticulocyte release is not the only reaction of the bone marrow to hemorrhage or mass senescence of cells. The other myeloid elements and lymphoid elements as well are affected. It is too early to form conclusions, but there are indications that a quantitative increase in granulocytes occurs, which is expressed chiefly by the neutrophils and a concomitant depletion of the circulating lymphocyte population.

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* This investigation was made possible by a grant-in-aid from the Bressler Alumni Research Fund.

† From the Department of Histology, School of Medicine, University of Maryland.

Hemoglobin records show that this element follows faithfully the age curve of the red cell. Hemoglobin curves fall during the reticulocyte showers but rise as the red cells age.

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ONE HUNDRED AND TWENTY-EIGHTH PROGRAM MEETING

The One Hundred and Twenty-Eighth Program Meeting was held on May 26, 1943 at 4:00 P.M. in the Bressler Lecture Hall.

The program consisted of the following papers:

"The Relationship between the Nutritional State and Resistance to Low Oxygen Tension," by Drs. D. C. Smith, R. H. Oster, and J. E. P. Toman, Department of Physiology, School of Medicine, University of Maryland.

"The Physiology of Thiamin Deficiency," by Dr. Guy M. Everett, Weaver Fellow in Physiology, School of Medicine, University of Maryland.

Abstracts of these papers follow.

THE RELATIONSHIP BETWEEN THE NUTRITIONAL STATE AND RESISTANCE TO LOW OXYGEN TENSION IN THE CAT

D. C. Smith, Ph.D., R. H. Oster, Ph.D., and J. E. P. Toman, Ph.D.*

The length of time in which male cats maintained respiration in an atmosphere of 3.25 per cent oxygen was determined for various nutritional states. Successive runs made on individual animals showed that those on a thiamin deficient diet or a reduced diet maintained respiration for longer periods than cats kept upon a normal diet. Correlated with this was the fact that on the thiamin deficient diet and the reduced diet the animal was unable to maintain its body weight, whereas on the normal diet the body weight stayed constant or else increased. On the average the normal animals maintained respiration at 3.25 per cent oxygen for about forty minutes, with a range of from twenty to sixty minutes; the cats on the reduced caloric intake averaged about sixty minutes with a range of from forty to eighty minutes. The fact that reducing the caloric intake of the cat had the same effect on the resistance to low oxygen tension as thiamin deficiency shows that in the latter condition the increased resistance is not attributable to a specific effect of the absence of thiamin but is the result of the malnutrition caused by the anorexia and consequent reduced food intake of the thiamin deficient animal.

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*From the Department of Physiology, School of Medicine, University of Maryland.

THE PHYSIOLOGY OF THIAMIN DEFICIENCY

Guy M. Everett, Ph.D.*

A series of studies has been made on eighty-five cats receiving a thiamin deficient diet supplemented with crystalline pyridoxine, pantothenic acid, and riboflavin given orally and intraperitoneally.

The development of thiamin deficiency was characterized by the appearance of anorexia and vomiting during the first two weeks. In the fourth or fifth week the animals suddenly entered a critical stage showing the following neurologic disorders: asynergia, dysmetria, head ventroflexion, pupillary dilatation, and in most cases short tonic convulsive seizures. The injection of thiamin brought about a rapid, dramatic recovery within a day.

Serum chloride, serum potassium, serum glucose, blood and urine bisulfite binding substances, and hematocrit showed no significant change during thiamin deficiency. No catatorulin effect can be demonstrated in the cerebral cortex of cats in the critical stage.

Electrocardiographic studies revealed arrhythmia and a type of bradycardia caused by the sinus arrest in critical stage animals. Atropinization showed that the sinus arrest is of vagal origin.

Detailed observations of general behavior and reflex activities of critical stage cats showed definite impairment of the labyrinthine righting reactions, vestibulo-ocular reflex pupillary light reflex, and the typical signs of cerebellar dysfunction. An analysis of these findings revealed that most of the reflex pathways involved have important centers in the midbrain, which is probably the site of the functional lesion responsible for the nervous disorders.

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*Weaver Fellow in Physiology, School of Medicine, University of Maryland.

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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1944

NEWS FROM THOSE IN THE ARMED FORCES

142nd General Hospital,
Somewhere in the South Pacific.

What news can I dig up? As you perhaps know by now, we are located on a tropical island in the southwest Pacific. There are two climatic sides, a wet and a dry. We are located on the dry side; Alvin Jones, George Finney and the others are on the wet side. As you know 'tis winter, or rather, early spring here now. The temperature varies from 90 to 110 F. in the day but is cool and sleepable at night. Usually there is a breeze that helps evaporate the perspiration—which flows freely with any physical exertion. There has been very little rain thus far but when it rains it doesn't fool. Howard Mays estimated a fall of about seven inches in one shower we had that lasted an hour and a half. Naturally, following there is bound to be MUD; however, the water runs off rather than being absorbed and the sun and air quickly dry off the turf. Altogether the weather has been fine but they tell us it really gets hot in the summer; we'll see.

The natives here remind one of your Bill—they are friendly and of good physique; very little disease is observed among them. Robby has seen a few cases of yaw and I expect to visit one of the clinics on the island next week. Syphilis is rare among them and so was G.C., I hear, until the troops arrived. On hikes we have visited some of the villages and were introduced to some of the rites and ceremonials. Also, I as well as Eph and several others have managed to collect some trinkets of ancient vintage by which

Major General Norman Thomas Kirk
The Surgeon General of The United States Army
Class of 1910
School of Medicine, University of Maryland

hang some interesting tales. These will have to be told to you all at some future time. One Sunday Waknitz, the orthopod and a swell chap, and I took an all-day hike. We arrived at a native village and finally ran into one who spoke a little English; he happened to be the native preacher. We made overtures with a few Luckies and coins and as a result were invited to attend the service. Ha-ha! It was Methodist, believe it or not, and right there I thought of you. The setting was unique, to say the least; the service though not understandable was worth while, because of the singing which was beautiful, especially the deep throaty resonance of the male voices; it was well done. Naturally there were many curious eyes turned our way, especially the youngsters'. It was a thoroughly enjoyable day.

The plants and animals we have seen on various trips are everything you'd expect, field upon field of sugar cane; banana trees in groves also growing wild; guava trees; wild lemon trees, the fruit of which is the size of our large oranges; coconut palms everywhere and they are mighty good; bamboo growing wild along the streams; cultivated rubber trees (the first I'd ever seen); palms of nearly every variety. Hibiscus grows wild everywhere, as do bougainvillea and canna. I have heard that the hibiscus plant is the source of a powerful abortifacient which is used by the natives; they will not tell about it. In addition there is an exotic tree, the so-called "flame tree." It is without leaves but has large beautiful scarlet blossoms which can be seen at quite a distance. There are no snakes here to speak of and no wild animals, with the exception of wild horses, pigs and cattle. The mongoose imported years ago to get rid of the sugar cane rat is here in numbers. There are thousands of toads abroad at night, the Costa Rican variety, imported to keep insects down and supposed to eat something like ten to fifteen times their own weight in twenty-four hours. They are of large size and not so pleasant to step on at night. Small lizards are here, also our friends who help keep the insects down. Now did you say mosquitoes? Yes, we have them. Eph has made a nice collection but to date has found no anopheles. The mosquito net is used by all and works out 100 per cent to give a good night's sleep. Incidentally, the heavens here are second to none I've seen for beauty and splendor, with more meteors than I've ever seen in my whole life. I have taken some walks into the bush with Vernon, Eph, McKinney, and Mays and had a firsthand look at jungle. Old mosquito man Eph has a picnic every time.

About the hospital, not much is permitted to be told. As you know, we are and have been functioning. Improvements are being made daily. The amount of work is so far only moderate. Copeland, Monte and I rotate on surgery and give about 75 per cent to the boys on surgery. Coughlan is acting chief anesthetist, which does not please him too much, but we let him get his hand in too. Jim Greiner and Eph have evolved a nice lab and do excellent work under the conditions, even talking about cutting sections ere long. The camp was suddenly struck by, as later turned out, old b. Flexner, lightning fast, elevations from 100 to 105 F., with cramps and eight to twenty trips a day. Vernon had everything under control in about four days. We both escaped, because of our righteous living, no doubt. Castor oil, sulfaguanadine and fluids did the trick. The equipment that we have is tops, i.e., *what* we have; more is dribbling in but many improvisions were at first necessary. Of course, American ingenuity handled that in all branches with speed and we got a big kick out of it.

142nd General Hospital Command Flag Ceremony—Formal Retreat
November, 1942

The hospital is located on a rolling plateau at the foot of some beautiful sheer cliff mountains. There is a river between from which we get our water; it is amply chlorinated and now tastes all right. That is one thing easy to get used to. There is only entertainment here that we make ourselves. While things are light we have regular times for athletics, which we all enjoy in our trunks. The boys look fine and nearly everyone is well tanned. Occasionally one of the other outfits brings over some movies which are thoroughly enjoyed by all despite their antiquity. One realizes what a spoiled bunch we were, and I mean were. We have learned a great deal I assure you, and not about our specialty either.

Time runs along at a fairly good pace and we are all feeling tops. Mail days are particularly cardinal events and make the distance seem less.

Sorry you can't get in, if that's what you want, but remember it takes guys like you to prepare guys like us and your job is just as important, though I realize too that you would like to play with us out here. We are not impatient but all hope it does not take too long to get these yellow bellies ploughed under.

My best to you all.

Sincerely,
Harry Hull.

The following is an extract from a letter from Capt. E. T. Lisansky received since going to press:

. . . I am temporarily detached from Hospital Unit No. 142 and have been removed from them for a number of months. Naturally, I have lost contact with them. I am many miles removed from their base and mail service out of my present location is most unsatisfactory. The special work that I am doing now is very demanding, requires much traveling about. . . . If I return to the Unit I may write another installment. . . .

Sincerely,
E. T. Lisansky

U. S. Naval Air Station
Pensacola, Florida
April 28, 1943.

Several recent graduates of "Maryland" are attached to the Station or are undergoing instruction here at Pensacola. They are making a fine record in the Navy. Dr. E. R. Ruzicka is the anesthetist at the Naval Hospital and the chief of surgery there tells me he knows his stuff and is very popular. Drs. Francis Taylor (who was in Jack Savage's class), Dan H. Mathers, Charles E. Pruitt, George Ulrich, and Dick W. Worthington are at present students in the School of Aviation Medicine, where I have been an instructor for the past eighteen months.

Commander Herbert G. Shepler, our executive officer, is doing a grand job as second in command of the medical detachment. The school consists of eighty students, forty of whom are under instruction for eight weeks, the remaining half for sixteen to twenty weeks. The men in the short course become aviation medical examiners. The long course boys graduate as flight surgeons, the length of the course, sixteen to twenty weeks, depending on the weather, the number of planes available, the number of instructors on hand, and other factors.

My work here is primarily didactic, that is, I do not instruct in flying. That is done by graduate Naval aviators, officers who have had considerable postgraduate flying time. I taught cardiology for a year until Dr. Graybill came down from Boston and then I took over physical diagnosis, i.e., the examination and its important bearing on aviation. As chief flight examiner here I see some interesting sidelights on problems peculiar to the aviator. It is an interesting and growing field of medicine and I hope to stay with it in one capacity or another after the war is over.

I went through the course here as an aviation medical examiner in August and September, 1941, and was then asked to stay and teach, thanks to the basic training and experience in the Department of Pathology in 1932 and 1933. I will probably be ordered to sea duty shortly; I understand that my relief is here and that I am about due for transfer, as I was designated a flight surgeon and awarded my wings a fortnight ago.

We are always glad to entertain the Maryland boys and their wives who come for duty and/or instruction here in Pensacola. The faculty members at the School of Aviation Medicine are highly pleased with the spirit and caliber of the Maryland men, which is the real purpose of my writing to you.

Please remember me to all my friends on the faculty, and let me know the names of your Maryland boys who may be scheduled to report in Pensacola.

Sincerely,
Christopher C. Shaw.

Dr. Christopher C. Shaw, Class of 1931, entered active duty on May 19, 1941 as a Lieutenant Commander in the Medical Corps of the U. S. Naval Reserve. For the past eighteen months he has been serving as an instructor in the Naval School of Aviation Medicine at Pensacola, Florida. He was designated a flight surgeon on March 8, 1943. On May 21, 1943 Dr. Shaw was promoted to the rank of Commander. His present assignment is that of senior flight surgeon and president of the Board of Medical Examiners for the U. S. Naval Air Training Center at Pensacola.

Hq. Med. Sec., A.B.S.
Somewhere in Africa

My job here has been most fortunate for me and I'm really having the time of my life, quite busy and glad for that; I hope to remain busy for the months to come. My work is exclusively with typhus fever and related diseases, along with work on our typhus vaccine. We have a little laboratory here and have the advantage of working with men who are certainly experts as far as rickettsial diseases are concerned. As a conservative estimate, I would say that I have seen 3000 cases of typhus since the first of the year. These cases are in the native population. There is very little among the troops. My work consists of seeing soldiers who are suspected of having typhus, determining if they have enough vaccine, doing complement fixations as an index of enough vaccine, and also using the fixation for diagnosis. On numerous visits around the country we have seen typhus in the primitive state. We have two interesting experiments running now, one in a prison and one in a insane asylum. A large number of autopsies and skin biopsies in typhus have been done. An extra piece of tissue has been obtained in each case to bring back to the school. One of the most exciting parts of the work is that I keep strains going in animals and get the strains started from infected lice. These parasites are obtained from the clothes of patients. One man, no joking, had at least 10,000 lice in his clothes. There is a fever here known as boutonneuse fever that is similar to spotted fever. It is caused by a tick, produces a rash, and gives cross immunity in animals with spotted fever. Besides typhus, I have seen much plague, smallpox, rabies, typhoid, and almost any disease you can mention. We are happy to state, however, that so far we have kept typhus out of the troops. There is nothing like soap and water. The news of the war in the last several days has been good and I hope that it continues. There are many faces here, but what I wouldn't give to see a familiar one. Hope that things remain well with you.

Most sincerely,
Theodore Woodward.

Somewhere in N. Africa
April 18, 1943.

Today is Palm Sunday and the respite granted me on this holy day afforded me the opportunity to pen these lines in appreciative acknowledgement of your letters dated March 5th and 24th. It is a tranquil bright day with a clear blue sky overhead and we have just sauntered back from the services conducted by a very eloquent chaplain in a shaded, sheltered hollow, hemmed in by graceful silent pines and blessed by gentle refreshing breezes. The number of men and officers who joined in humble reverence was large and gave added evidence of the thoughts, hopes and faith shared by us in common. I trust that it was a lovely day for you, too.

I was happy to learn of the preparations for the coming commencement, the significance of which in these critical times reminded me of the speech "Medicine in the Crisis" delivered by Dr. Willard C. Rappleye to the graduates of the Long Island College of Medicine. The topsy-turvy world in which they are to commence their life's work is anything but a beauty rest mattress; yet there exists, as in no other period in history, the golden opportunity to serve a pock-marked globe, filled with the swarming anemic masses of forlorn, exhausted, yet hopeful mankind. You spoke of the small nucleus able to attend the reunion of your class. Though small it may have been, yet there must have been that feeling of immensity in the many from that group dispersed in meridian-like manner throughout the four corners of the globe and across the seven seas in the discharge of their honorable tasks. Indeed, that is a singular feeling accorded to few class reunions.

I am feeling well and healthy, something I partly attribute to the rough and primitive life and the silent adaptive hand of nature. The contrast in color and values has made life all the more vivid and in a broader perspective. We had a warm shower bath yesterday, the first in almost two months. I heard many notes of appreciation in the crowd and read many a line in like feeling in the mail I censored. During the past two months baths were luxuriously taken in a canteen of water in an improvised tub, our helmet, following which one's laundry was brewed in this high-assayed, richly-seasoned, captivating menstrum, the essence of which would have dispelled even the witches in Macbeth and sent cold chills down the spines of medieval alchemists. I have managed to keep both person and clothing clean. To the oft-made query by my executive officer on how I managed to keep clean came the reply that it was a mere manifestation of a long-ingrained, exaggerated habit. We all had occasion to boil our clothes the day before yesterday. The description of the residual liquor I shall leave to your imaginative senses, which in a pathologist must no doubt be keen. To prevent chiggers I sprinkled sulfur over my bedding roll and, being a restless sleeper by nature, a monomolecular layer of sulfur may be detected over one's integument. Your pardon is begged if, in realism, a note of apparent vulgarity has managed to creep in. My best wishes and cordial greetings.

Sincerely yours,
William S. M. Ling.

Nazi medical records captured in Tunisia revealed that thousands of German and Italian soldiers were victims of typhus, according to Lieut. Albert A. Kurland, Class of 1940, assistant battalion surgeon with the U. S. Armed Forces in Tunisia. Written from "Somewhere in Tunisia" to Dr. H. S. Rubenstein, Class of 1928, director of the laboratory for neuroendocrine research, surgical division, Sinai Hospital and under whom he had previously served, Lieutenant Kurland related his observations on the Tunisian battlefront.

Although the captured records showed that the Nazis were beset with typhus, there were no cases among the American troops who lived under the same conditions. Rigorous training and physical conditioning, along with the use of the most advanced medical practices, were credited by Lieutenant Kurland for the immunity of the United States troops. However, troops under the unrelenting pressure and drive of the campaign and subjected to almost continuous bombardment and shell fire showed other strange reactions. He wrote:

"During particularly heavy fighting men lost their appetite for food almost completely but they developed an extreme thirst, with the result that they often exhausted a whole day's water ration in two or three hours. With their water ration gone there was danger that the men would neglect the usual sanitary procedures. Many men started carrying two canteens of water."

Gastrointestinal complaints among the men were common, Lieutenant Kurland said, but, on the whole, the health of the troops was excellent.

"Abdominal cramps occurred sporadically among many men when under particularly harrassing conditions.

"American troops went into the battle 'green' but came out as veteran fighters who had won the commendations of their allies.

"In the beginning, under heavy shell and mortar fire many men lost their nerve and became useless as combat troops. It became necessary to issue orders forbidding them to dig foxholes while we were in the attack phase. But our troops soon became seasoned veterans and our men kept on driving until the victory was won. The British example of nonchalance did much to inspire our new troops.

"First-aid stations in the front were a particularly common target for German troops. An exposed first aid station seemed always to act as a magnet for German fire. We could never keep an aid station in one spot for more than forty-eight hours. The removal of wounded men from the battlefield could be made only at night. The Germans kept our wounded men covered by fire and it was only after nightfall that we could go out and gather them in. Many wounded had to stay in foxholes a whole day before we could get them. However, there were very few cases of shock and the use of sulfanilamide which all soldiers carried was of immeasurable help in cutting down our casualties."

Out of Lieutenant Kurland's medical detachment of fourteen men and two medical officers, three were killed and eight were wounded, and practically all were cited for one or more awards. The pressure of duty on an advance first-aid station was occasionally relieved by humorous incidents. He wrote:

"We were attacking and Jerry was dropping everything he had on us, including the kitchen stove. Bombs were dropping all around us and we all hit for foxholes. The bombing had been going on for some time when a private rushed into the aid station. 'Look, Lieutenant,' the private said. 'I see spots in front of my eyes. It's beginning to worry me.' "

Everett L. Bishop, Comdr., M.C., U.S.N.R., Class of 1916, is on duty at the U. S. Naval Hospital, Charleston, S. C., where he has been stationed for some time. The commanding officer at this hospital is Captain Willard J. Riddick, M.C., U.S.N., a member of the Class of 1905. Other alumni who have been on duty here recently were Lieut. Comdr. I. L. C. Hummel, M.C., U.S.N.R., Class of 1927, and Lieut. M. B. Hollander, M. C., U.S.N.R., Class of 1931.

DESTROYER ESCORT TO BEAR NAME OF A WINSLOW RELATIVE

One of the new type Navy vessels, a destroyer escort, was named *Carroll* after Lieut. Herbert Fuller Carroll, Jr., a grandson of the late Dr. Randolph Winslow, grandnephew of the late Dr. John R. Winslow, and nephew of the late Dr. Nathan Winslow.

Lieut. Carroll was a graduate of the University of Virginia and the United States Naval Academy. He went down with his ship, the *Astoria*, last summer in an engagement with the Japanese. Secretary of the Navy Frank Knox, in a letter to the mother of Lieut. Carroll, wrote that the *Astoria* had participated in every major battle of the Pacific until sunk by enemy action. Mrs. Carroll christened the new vessel.

The University of Maryland extends to the parents of Lieut. Carroll its heartfelt sympathy in the loss of such a splendid son and promising young officer, and acknowledges its debt to all the Winslows who have played such an important part in helping to make the University of Maryland the great institution it is today.

Lieut. John R. Godbey, M.C., U. S. A., Class of 1935, has been presented the Silver Star medal for "conspicuous gallantry and intrepidity during action against enemy Japanese forces on Guadalcanal."

The citation accompanying the award read:

> "While his battalion was engaged in hand-to-hand combat with the enemy, during offensive action last November 3 along the Matanikau River, Lt. Godbey, with complete disregard for his own personal safety, remained on and advanced with the front assault line, taking care of the wounded and supervising evacuation."

REGISTRANTS FOR COMMENCEMENT ACTIVITIES

The following alumni registered during the commencement activities held in March: Drs. Harry D. Vincent, Schenectady, N. Y.; Harry G. Nickel, Carlisle, Pa.; Wm. F. Weitzel, Indiana, Pa.; George C. Medairy, Owings Mills, Md.; B. C. Waddell, Grassy Creek, N. C.; Arthur C. Lewis, Fall River, Mass.; Harley M. Johnson, Johnston, S. C.; James C. Doughty, Onancock, Va.; James R. Parker, Norfolk, Va.; C. W. Lurting, Pittsburgh, Pa.; E. W. Cross, Tarentum, Pa.; Karl J. Myers, Philippi, W. Va.; M. F. Kocevar, Steelton, Pa.; C. Melvin Coon, Athens, Pa.; J. A. Guthrie, Huntington, W. Va.; S. H. White, Yorktown, Va.; T. R. Paganelli, New York City; Alston H. Lancaster, Worcester, Mass.; John Mace, Jr., Cambridge, Md.; James Young, Yonkers, N. Y.; A. W. Valentine, Washington, D. C.; Benjamin Isaacson, Washington, D. C.; W. Wayne Babcock, Philadelphia, Pa.; H. H. Haynes, Clarksburg, W. Va.; Oscar T. Barber, Fredonia, N. Y.; J. S. Coughlan, Berkeley Springs, W. Va.; Edward W. Sprague, Newark, N. J.; H. B. McDonnell, College Park, Md.; Charles W. Finnerty, Boston, Mass.; E. L. Jones, Philadelphia, Pa.; L. W. Cobun, Morgantown, W. Va.; J. Henry Orff, Shillington, Pa.; L. L. Heimoff, Bronx, N. Y.; J. Walter Layman, Hagerstown, Md.; W. C. Stone, Westminster, Md.; George H. Steuart, Ottoman, Va.; F. C. Craven, Asheboro, N. C.; A. W. Colcord, Clairton, Pa.; Drs. Lester W. Day, John F. Lutz, Newland E. Day, Edgar B. Friedenwald, C. Reid Edwards, George McLean, Henry J. Walton, Joseph Sindler, Margaret B. Ballard, Maurice Chideckel, George A. Strauss, Samuel S. Glick, Arthur Hebb, John G. Onnen, Fred B. Smith, Milton S. Sacks, C. B. Ensor, C. A. Clapp, Byruth Lenson-Lambros, C. Loring Joslin, A. H. Finkelstein, T. Joseph Touhey, Edward A. Looper, Thomas R. O'Rourk, F. A. Ellis, E. Eugene Covington, William H. Smith, Louis H. Douglass, W. R. Johnson, Louis C. Dobihal, John A. Wagner, and Clewell Howell of Baltimore.

REUNIONS

The following classes held reunions in connection with the commencement activities held in March and attended the 136th Annual Banquet of the Medical Alumni Association on March 24, 1943:

1893 P. & S.—Dr. Charles Blake, Chairman
1898 B.M.C.—Dr. Arthur Hebb, Chairman
1903 P. & S.—Drs. Edgar B. Friedenwald and George Sargent, Chairmen
1903 B.M.C.—Dr. John Evans, Chairman
1908 P. & S.—Dr. John G. Onnen, Chairman
1913 U. of M.—Dr. W. H. Toulson, Chairman
1913 P. & S.—Dr. William T. May, Chairman

1918—Dr. Joseph Sindler, Chairman
1923—Dr. Nathaniel Beck, Chairman
1928—Dr. Benjamin S. Rich, Chairman
1933—Dr. Leon Kochman, Chairman
1938—Dr. John A. Wagner, Chairman
1939—Dr. Henry A. Briele, Chairman
1940—Dr. F. Ford Loker, Chairman
1941—Dr. Raymond K. Thompson, Chairman
1942—Dr. J. Howard Franz, Chairman

ITEMS

A NEW ARGENTINE MEDICAL JOURNAL

A group of the leading professors of the School of Medicine and Universities of Argentina have decided to publish a monthly medical review which will be known under the name of *Revista Argentino-Norteamericana de Ciencias Medicas.*

This journal was organized for the purpose of diffusing and coordinating scientific work and investigations from the medical centers of both countries. The editors have extended an invitation to the staff of the University of Maryland to contribute articles for publication. These may be written in English and their staff of translators will prepare them for publication in Spanish.

Contributions should be addressed to

Dr. Alfredo C. Muscio, Secretario-General,
Revista Argentino-Norteamericana de Ciencias Medicas,
Ayacucho 576—Buenos Aires,
Republica Argentina.

DR. WALTER STEVENSON AWARDED 1942 MISSISSIPPI VALLEY MEDICAL SOCIETY DISTINGUISHED SERVICE AWARD

Dr. Walter Stevenson of Quincy, Illinois, B.M.C. 1906, was awarded the Mississippi Valley Medical Society Distinguished Service Award for 1942 at the Eighth Annual Meeting of the Society held at Quincy on October 1, 1942. The award is given annually to an active member of the Society for "unusual and distinguished service to the medical profession." The citation in connection with the award read:

> "Dr. Walter Stevenson, because of the eminence that you have attained in the practice of your specialty; because of your constant endeavor to broaden your medical understanding and to aid others in broadening theirs; because of your efforts to advance the interests of organized medicine; because you were one of the founders and the first president of the Mississippi Valley Medical Society, it is awarding you this medal."

Dr. Stevenson is a charter member and president of the Board of Trustees of the Society, was active in its formation, and served as its first president in 1935. He is a Diplomat of the American Board of Ophthalmology and the American Board of Otolaryngology; a fellow of the American College of Surgeons; a member of the American Academy of Ophthalmology and Otolaryngology, American Laryngological Association, and the American Laryngological, Rhinological and Otological Society; chief oculist and aurist at St. Mary's Hospital, Quincy; secretary of the Adams County Medical Society and the Quincy Physicians' Club; member of the Council, Illinois State Medical Society; member of the Board of Health Advisors for the State of Illinois; member of the Editorial Board of the Mississippi Valley Medical Journal; formerly editor of the Quincy Medical Bulletin; Captain, M.C., U. S. Army in World War I and served overseas.

During his entire professional career Dr. Stevenson has been greatly interested in medical organization work aside from the practice of his specialty and has given freely of his time for such activities. The award to Dr. Stevenson is not only a splendid tribute to him, but is a recognization of the great part that numerous members of the profession in the smaller communities are making to elevate professional standards. All previous recipients of this award have been teachers in leading medical schools.

DR. E. H. HEDRICK MADE SUPERINTENDENT AT PINECREST SANITARIUM

Dr. E. H. Hedrick, Class of 1917, was appointed by Governor Neely of West Virginia as superintendent of Pinecrest Sanitarium, Beckley, West Virginia.

In World War I Dr. Hedrick was an Army physician specializing in heart and lung diseases and first became interested in the treatment and prevention of tuberculosis. He was a member of the committee which in 1927 helped to secure the sanitarium for Beckley. He has pledged that the institution will be on the alert for new methods of treatment in addition to the latest surgical and medical treatments already employed, and anticipates that developments may arise from the present war which will greatly facilitate the all-out fight against tuberculosis.

Dr. Hedrick was born in Flat Top and educated there until twelve years of age, at which time his family moved to Beckley where he attended the local schools. He was graduated from Beckley Institute in 1911 and went directly into medical school. He graduated from the School of Medicine, University of Maryland, in 1917, served an internship in the University Hospital in 1917 and 1918, after which he served in the Army for almost two years. After his discharge he established his practice in Mabscott from 1919 to 1924, when he moved to Beckley. He has been there since that time. He served as county health officer from 1924 to 1930.

CONGRATULATIONS TO DR. IRA W. BEALL

The Bulletin wishes to extend congratulations to Dr. Ira W. Beall, P. & S. 1893, on the completion of fifty years' practice of medicine in Libertytown, Maryland, the place of his birth.

Dr. Beall is a tall, square-shouldered man of easy approach and a kindly disposition. He is in good health and vigorous for his years, which he attributes to the rugged life in the practice of his profession in a rural community. Before improved roads were built he was compelled to travel on horseback. With the saddlebags, attached to the rear of his saddle, containing medicine and instruments of the profession, he rode the storms in zero as well as torrid weather, over hill and dale in cow paths, through forest and meadow and blinding snow and rain, until he could glimpse the flicker of the candle in the window beckoning him to the bedside of the ill mother or child. Thus, through all his life he has exemplified the highest ideals of the ethics taught him.

There are about forty of Dr. Beall's graduating class of 179 members who are still alive. No doubt some of his classmates will follow-up this tribute with personal felicitations and thus renew old and pleasant friendships.

OBITUARIES

CARY BRECKENRIDGE GAMBLE, M.D.

Dr. Cary Breckenridge Gamble, P. & S. 1887, died on June 1, 1943 at the Union Memorial Hospital in Baltimore at the age of eighty-two.

During World War I Dr. Gamble served as a major in France with the University of Maryland Hospital Unit. He was a close friend of Dr. J. M. T. Finney and for a number of years served under Dr. William Osler at Johns Hopkins Hospital. A member of the staff of the Union Memorial, he practiced medicine until a few days before his death.

Born in Tallahassee, Florida in 1861, he was the son of Dr. Cary Breckenridge Gamble and Eduardo Shaw Gamble. In 1867 his father moved to Baltimore to practice medicine.

Dr. Gamble graduated from Princeton in 1885 and two years later received his degree in medicine from the College of Physicians and Surgeons. For three years he studied in Vienna and Germany. When he returned he went into the clinic of Dr. Osler at Johns Hopkins Hospital. For many years he was a professor of medicine at the School of Medicine, University of Maryland. Until two years ago he served as an authority on heart diseases for a New York life insurance company. Starting out as a general practitioner he took a special interest in the treatment of diseases of the heart and blood vessels. His knowledge in this field led to his appointment by the War Department in 1917 to head a medical unit specializing in the treatment of heart disease. He served at Camp Meade before going abroad.

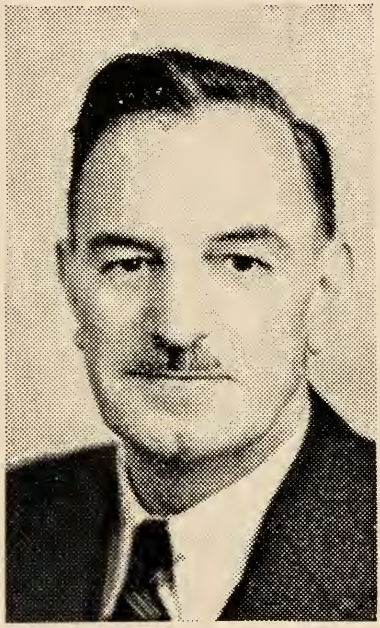
Dr. Gamble was a member of the Baltimore Medical Society and other organizations.

ALEXANDER JAMES GILLIS, M.D.

Dr. Alexander J. Gillis, former chief urologist at Mercy Hospital, died at his home, 106 Thicket Road, Baltimore, on February 6, 1943. He was stricken with coronary thrombosis in June, 1937 and one year later retired from active practice on the advice of his attending physicians.

Dr. Gillis was born in Carbondale, Pennsylvania on October 13, 1888, the son of the late Dr. Alexander F. Gillis and Anna Boyle Gillis. There he received his early education in the grade school, attended St. Thomas' College in Scranton, and then studied medicine at the College of Physicians and Surgeons in Baltimore, where he obtained his degree in medicine in 1914.

From 1915 to 1917 Dr. Gillis was the assistant superintendent of Sydenham Hospital. In the latter year he volunteered for service in the First World War, was assigned to a British Army Unit, and served with it until the end of the war. He was wounded in action while in France and was



Alexander James Gillis, M.D.

awarded the British Military Cross for conspicuous gallantry under fire. He also received the Purple Heart, an American military decoration. At the end of the war he resumed his medical practice in Baltimore and specialized in urology, to which he devoted his entire time and study until his retirement. In 1922 he was appointed chief urologist at Mercy Hospital and in that capacity he served until serious illness forced him to retire from active practice.

Dr. Gillis possessed a keen sense of humor which brightened the day for many patients, and his charity, thoughtfulness and conscientious spirit were firmly molded into a noble character. During his time at Mercy Hospital he was also professor of urology at the School of Medicine of the University of Maryland.

Dr. Gillis was a member of the Baltimore City and the Maryland State Medical Societies, the American Medical Association, a fellow of the American College of Surgeons, and a member of the American Urological Society.

Thomas K. Galvin, M.D.

HENRY FRANCIS HILL, M.D.

The death of the oldest alumnus of the School of Medicine, University of Maryland, Dr. Henry Francis Hill, occurred on May 12, 1943. He was eighty-eight years old and a graduate of the Class of 1877. For many years Dr. Hill practiced at 3711 Liberty Heights Avenue and was widely known as an excellent physician and a sincere friend. He was especially fond of fishing and hunting and spent considerable time in deep-sea fishing during the winter months in Florida. Although he found it necessary to limit his practice in later years, he remained active until a week before his death.

JOHN S. ZIEGLER, M.D.

Dr. John S. Ziegler, Class of 1878, died at Brooksville, Maryland on March 3, 1943 of coronary occlusion.

Dr. Ziegler was born on August 17, 1859 in Shrewsbury Township, York County, Pennsylvania. He received his early education in the public schools of York County and the Glen Rock Academy at Glen Rock. Previous to his entrance in medical school he served one year under his preceptor, Dr. Frey, in the capacity of a drug clerk. He had the distinction of being the youngest member of his class at the University of Maryland; in fact, he was awarded his degree in medicine before he was twenty-one years old.

From 1879 to 1919 Dr. Ziegler practiced at Melrose, Carroll County, Maryland. He then moved to Hanover, Pennsylvania and continued his practice in that town and its environs until he retired on March 1, 1940. As a country physician he rendered general medical service including emergency surgery, which frequently was done in the homes of his patients under improvised conditions.

Dr. Ziegler took an active part in the meetings of various medical associations and was one of the sponsors of the Hanover General Hospital. In 1939 he was awarded a certificate for sixty-one years of meritorious service by the Pennsylvania Medical Association. He was a member of the Hanover Medical Club, the York County Medical Association, and the American Medical Association.

Barron, William E., Addison, N. Y.; P. & S., class of 1891; aged 70; died, December 21, 1942, in the Veterans' Administration Facility, Bay Pines, Fla.

Browne, George Cecil, Oakland, Calif.; P. & S., class of 1899; aged 66; died, January 20, 1943, of heart disease.

Byers, William Elyet, Baltimore, Md.; B.M.C., class of 1904; aged 69; died, February 28, 1943, of bronchopneumonia and advanced carcinoma of the prostate.

Carvell, Hanford, Gloucester, Mass.; B.M.C., class of 1910; aged 67; died, February 15, 1943, of virus pneumonia and myocarditis.

Cogan, Jesse Franklin, Dawson, Pa.; B.M.C., class of 1892; aged 77; died, January 1, 1943, of cerebral arteriosclerosis.

Dashiell, Nicholas Leeke, Baltimore, Md.; class of 1882; aged 82; died, January 8, 1943, of injuries received when struck by a trolley car.

Davis, Theodore Benjamin, Newnan, Ga.; P. & S., class of 1881; aged 85; died recently.

Gamble, Rober G., Haverford, Pa.; class of 1884; aged 80; died, March 12, 1943, of coronary occlusion and arteriosclerosis.

Harris, Allan, Greenwich, N. J.; B.M.C., class of 1902; aged 69; died, November 2, 1942, of coronary embolus, arteriosclerosis and hemiplegia.

Harris, Raymond Victor, Savannah, Ga.; class of 1907; aged 62; died, January 23, 1943, of angina pectoris.

Jenkins, Felix S., Pikesville, Md.; class of 1887; aged 80; died, January 24, 1943, of arteriosclerosis and coronary occlusion.

Jester, Homer Bates, Corsicana, Texas; P. & S., class of 1901; served as major in the Medical Corps of the U. S. Army during World War I; aged 67; died, January 26, 1943, of coronary thrombosis.

Kelly, Michael Bernard, Wheeling, W. Va.; P. & S., class of 1903; served during World War I; aged 70; died, December 10, 1942, in Charleston, W. Va.

Kohler, Horace W., Red Lion, Pa.; P. & S., class of 1911; aged 51; died, January 4, 1943, of coronary thrombosis.

Long, Edgar Miller, Hamilton, N. C.; class of 1909; aged 56; died, February 24, 1943, of adrenal insufficiency.

Maney, John Joseph, Lawrence, Mass.; B.M.C., class of 1900; aged 67; died, December 11, 1942, of chronic myocarditis.

McElroy, James Bassett, Memphis, Tenn.; P. & S., class of 1893; aged 76; died, March 24, 1943.

Miller, Dennis, Dallas, Texas; P. & S., class of 1890; aged 76; died, February 20, 1943, of cerebral hemorrhage and arteriosclerosis.

Perry, Benjamin Cecil, Bethesda, Md.; B.M.C, class of 1906; aged 61; died, January 8, 1943, of chronic cardiovascular degeneration.

Stewart, Earl Minor, Eagle, Neb.; P. & S., class of 1900; aged 71; died, February 14, 1943, of terminal hypostasis caused by cerebral arteriosclerosis.

Thomas, David Owen, New Kensington, Pa.; B.M.C., class of 1905; served during World War I; aged 70; died, January 14, 1943, in the Veterans' Administration Facility, Aspinwall, Pa., of myocarditis.

Utley, Herbert Hector, Benson, N. C.; B.M.C., class of 1906; aged 66; died, January 15, 1943, of coronary occlusion.

White, Walter Walton, Jr.; Baltimore, Md.; class of 1896; aged 67; died, January 2, 1943, of carcinoma of the spine.

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PRIMARY CARCINOMA OF THE LIVER*†‡

A Clinical-Pathologic Report of Fourteen Cases at the University Hospital from 1927 to 1943

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Ever since Rokitansky's (21) observation in 1849 that carcinoma of the liver is often a primary affection there has been a steadily increasing interest in this subject.

In the past there have been a number of comprehensive reviews, notably those of Eggel (8), Winternitz (31), Fox and Bartels (10), and Charache (6).

The purpose of this paper is to bring the subject up to date and to review fourteen cases which occurred at the University of Maryland Hospital between 1927 and 1943, all of which came to autopsy.

The incidence of primary carcinoma of the liver varies somewhat with different reports in the literature. It is not rare but it is uncommon compared with secondary liver involvement, at least in Europe and America, where the ratio of primary to secondary liver cancer is 1 to 30. It is anything but rare among the dark-skinned races of South Africa, China, and India, as will be noted. For example, the ratio of primary to secondary carcinoma of the liver in India is 1.45 to 1 (1).

The incidence of this type of cancer in the United States and Europe is given as 0.133 per cent in 29,215 autopsies reported by Fox and Bartels; 0.25 per cent in the statistical review of Berman (3); and 0.488 per cent in Charache's review. In the series herewith reported fourteen cases repre-

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sented 0.51 per cent of all autopsies at the University Hospital from 1927 to the present, 2723 at this writing. This is more than one primary carcinoma of the liver in every 200 autopsies. The statistical reports from the Orient and South Africa are somewhat higher, as listed in the following table by the observers mentioned:

	AUTOPSIES	S. AFRICA	ORIENT (CHINA, JAPAN, JAVA, AND INDIA)	EUROPE	AMERICA
Pirie	3900	1% (approx.)			
Fox and Bartels	29,215			0.133% combined	
Charache	159,762		1.026%	0.48% combined	
Berman	408,364	1.2%	0.85%	0.13%	0.25%

This disease constitutes between 1.2 and 3 per cent of all malignancies in Europe and America. In South Africa, Pirie (20) found primary liver cancer to constitute 39.5 per cent of all malignant disease for a period from 1912 to 1921, and Berman (3) found this tumor to constitute 90 per cent of all malignant disease in mineworkers of Johannesburg, South Africa.

Pirie believes that the high incidence of primary carcinoma of the liver among South African natives may be related to frequent parasitic infection of the liver, schistosomiasis, which leads to cirrhosis and then carcinoma. Strong and Pitts (25) and Tull (28) independently published reports on the frequency of the disease among the inhabitants of Southern China and these observers pointed out the prevalence of liver fluke infestations and the resulting cirrhosis which apparently is followed by carcinoma. The relationship of cirrhosis to primary carcinoma of the liver will be discussed more fully.

Hanot and Gilbert (14) in 1888 first classified carcinoma of the liver according to its macroscopic appearances as 1) cancer massif, 2) cancer nodulaire, and 3) cancer avec cirrose. Eggel (8) substituted the term diffuse cancer for cancer with cirrhosis, since he also found massive and nodular types occurring in livers with cirrhosis. Eggel further attempted to differentiate the tumors into those derived from liver cells and those derived from bile duct epithelium. Goldzieher and Bokay (11) divided liver cancer into two main groups: those derived from small bile ducts or carcinoma cholangiocellulare and those derived from liver cells or carcinoma hepatocellulare. Yamagiwa (32) suggested the terms cholangioma and hepatoma.

In a review of the controversial literature regarding the histogenesis of primary liver cancer Winternitz (31) discussed the microscopic characteristics of these growths: first, their tendency to conform to the structure of the tissue from which they arise, the bile duct cancers often forming tubulo-adenomatous patterns and the liver cell cancers trabecular structures; second, the conformity of the cells to the matrix type cell. The duct cancer cell is cuboidal or cylindrical, with a clear cytoplasm; the liver cell cancer is polygonal or polyhedral, with a granular cytoplasm, and occasionally contains bile pigment. Third, the duct cancer always has a connective tissue stroma which divides it into alveoli; the liver cell cancer has a capillary stroma. Through anaplasia the liver cell cancer may assume a tubular structure.

As with any cancer, Ewing (9) writes that many liver cancers are so far removed from their usual morphology that some doubt must always remain regarding their true origin.

Accordingly, the criteria for a diagnosis of primary carcinoma of the liver are: first, an absence of any other primary site; second, the tumor cell must conform to one or the other of the microscopic patterns mentioned.

From a gross standpoint the multinodular growths are the most common. Eggel reported that 104 out of 163 or 64.4 per cent of his collected cases were multinodular, 23 per cent massive, and 12.4 per cent diffuse. Gustafson (12) divided his cases as follows: thirty-seven multinodular, thirteen massive, and twelve diffuse. Six of the cases at the University Hospital were multinodular, five were massive, and three were diffuse. The frequency of the multinodular type is readily understood when one considers that branches of the portal and hepatic veins are commonly the sites of tumor thrombi. Thus, a tumor of unicentric origin may produce multiple intrahepatic metastases, the so-called multicentric tumor. The gross and microscopic appearances have little in common; the nodular, massive, and diffuse forms appear in any microscopic type.

Histologically, the liver cell type or hepatoma is the more common growth. Eggel reported ninety-five instances of liver cell and fourteen of duct cell; Gustafson in his cases found thirty-eight to be liver cell and twenty-two duct cell; Yamagiwa had twenty-one and eight; Tull reported ninety-nine and thirty-five. In the University Hospital series six growths were hepatomas, eight were cholangiomas. However, several were difficult to classify with certainty.

Primary carcinoma of the liver is principally a disease of males, between 60 and 70 per cent of the reported cases occurring in this sex. Hepatoma appears to be much more frequent in males, whereas cholangioma is about equally divided. This may be explained by the predominance of cirrhosis in men and bile duct infection or obstruction in women. In Eggel's series 68 per cent of the hepatomas were found in males and 57 per cent of the cholangiomas occurred in females. Gustafson reported 97 per cent of hepatomas in the males of his series and 40 per cent of cholangiomas in the females. Twelve of the University Hospital patients were males, seven colored and five white. There were two females, both white. All of the hepatomas and six of eight cholangiomas occurred in males.

As with most malignancies, the highest incidence occurs in the group ranging from forty to seventy years of age. Eggel found sixty-three of ninety-five cases of liver cell and seven of thirteen of duct cell in this group. Yamagiwa reported eleven of twenty-one hepatomas and all of eight cholangiomas to be in this age span. However, Eggel found twenty-two of ninety-five hepatomas occurring before forty years of age, three before twenty, and eight after seventy. He also noted five of thirteen cholangiomas before forty, one before ten, and one after seventy. The age incidence for the cases reported from China and Africa was considerably younger, being an average of forty-four years in the Chinese and the majority in the African reports occurring before the age of forty. In the University Hospital series the ages ranged from thirty-eight to eighty-three, the average being fifty-seven.

Besides the multinodular, massive, and diffuse types of liver carcinoma, Ewing describes a solitary adenoma which occurs most frequently in early life, even in infancy, the benign character of which is chiefly the result of encapsulation and in which transition to adenocarcinoma often occurs. These are not associated with cirrhosis and it is thought that misplaced embryonal rests account for these malignancies.

Primary carcinoma of the liver, therefore, may develop in any age group, even in the two extremes of life. Much has been written on primary liver cancer in childhood. In 1929 Kilfoy and Terry (16) reviewed the literature up to that time and found only thirteen authentic and proved cases in childhood, the average age being 8.65 years. Steiner (23) studied the reports of 105 cases in children under sixteen and accepted seventy-two as meeting the diagnostic standards. Since then ten additional cases have been found in the literature up to 1942, making eighty-two cases reported by Tomlinson and Wolff (27).

The frequency of occurrence of cancer of the liver with cirrhosis is pointed out by Berk and Lieber (2) in a review of the literature from 1931 to 1941. They found that 658 of 1073 reported cases of primary cancer of the liver, 61.3 per cent, had cirrhosis. This frequency is illustrated by the following table which shows a total of 333 cases of both types, with 65.1 per cent occurring in cirrhotic livers.

AUTHOR	LIVER CELL CANCERS		DUCT CELL CANCERS	
	No. of cases	*Percentage with cirrhosis*	*No. cases*	*Percentage with cirrhosis*
Tull	99	75.7%	35	65.7%
Eggel	66	86.4%	8	62.5%
Gustafson	39	64.1%	23	33.3%
Yamagiwa	27	74.5%	15	46.7%
Goldzieher and Bokay	14	100.0%	7	42.8%
	245	80.1%	88	50.2%

This table is of interest since it points out, first, that a large percentage of cases of cancer of the liver is associated with cirrhosis and, second, that cirrhosis is much more frequently associated with cancers arising from liver cells than with those arising from the duct epithelium. If the cirrhosis is analyzed it will be found that the largest number shows typical portal cirrhosis; other types also occur, such as syphilitic cirrhosis, parasitic infestations, obstructive biliary cirrhosis and pigment cirrhosis (malaria and hemochromatosis), and the cirrhosis of liver stasis. For example, Sanes and MacCallum (23) reported two cases of cholangioma developing in bile ducts obstructed by stones associated with cholangitis, cholestasis, and fibrosis of the duct walls. The frequency of occurrence of carcinoma of the liver with hemochromatosis, most of which show cirrhosis, is about the same as the incidence of liver cancer in cirrhosis alone (22, 2).

In the University Hospital cases all six hepatomas were associated with cirrhosis. Five were true portal cirrhosis and one was diffuse. Only one of eight cholangiomas had cirrhosis and this was the diffuse type.

It seems, therefore, that cancer of the liver may be associated with any disease of this organ where there is regeneration following an injury. Most writers believe that as a result of injury there is destruction of the liver tissue followed by fibrosis and regeneration. This results in the production of hyperplastic nodules of liver cells and bile duct structures, just as may be found in any cirrhotic liver. Such products of regeneration may be indistinguishable from true adenomata, which Ewing calls precarcinoma, and were it not for the cirrhosis which is sufficient to explain their occurrence they might be called adenomata. As a result of further injury of the same character the necrosis and regeneration continue, the cells gradually lose their function, and through a proliferation exceeding their goal become malignant. This is Weigert's conception as cited by Winternitz (31).

This hypothesis may further be utilized to explain the relatively greater frequency of liver cell cancers with cirrhosis than bile duct growths with cirrhosis. The regenerative powers of these structures have been determined by experimental work, and it has been demonstrated that after injury to the liver, the connective tissue, liver cells and the bile ducts participate in the repair. The liver cells are, however, much more active than the bile duct epithelium, have a greater proliferative capacity, and are as a result more often stimulated to malignant tumor growth.

Recent experimental work has been done on rats in which primary carcinoma of the liver can readily be produced by feeding a substance, butter yellow or dimethyl-amino-azobenzene, which causes liver damage followed by cirrhosis and cancer. The investigators (13, 18) found that feeding the rats a diet rich in protein or the amino acids cystine and choline, with vitamin B complex, definitely protected the liver against the development of carcinoma. Perhaps, then, the dietary factor so obviously important in alcoholism and portal cirrhosis plays some role in the development of primary carcinoma of the liver.

Counsellor and McIndoe (7), after a study of the literature and of material at the Mayo Clinic, made the statement that 3 to 4 per cent of cases of cirrhosis will develop into carcinoma as the direct result of the changes induced by chronic inflammation.

It is of interest to note that few tumors metastasize to cirrhotic livers. A group of investigators (17) at Welfare Island Hospital searched the literature and found only five authentic cases, to which they added six of their own. They expressed the opinion that the cirrhotic liver might be unfavorable to the growth of transplanted tumor cells.

Extrahepatic metastases in primary carcinoma of the liver are not numerous and, as a rule, do not attain any considerable size. Intrahepatic veins, however, are most always involved and the tumor thrombi may extend to the larger veins, the inferior vena cava, and even to the right auricle. A pulmonary embolism of tumor origin resulted in the death of one of the cases herewith reported, A2670.

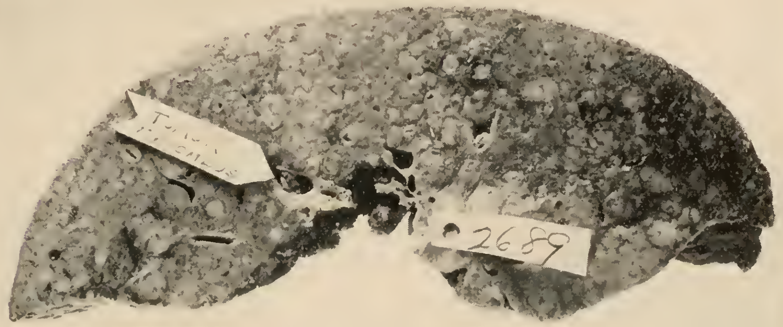
In spite of early vascular involvement, extrahepatic metastases are not frequent. When they do occur they are most often limited to the extrahepatic veins (portal, hepatic and vena cava), lungs and regional nodes as shown in the reports of Fox and Bartels, Tull, and Eggel.

	NO. OF CASES	EXTRA-HEPATIC VEINS	LUNGS	REGIONAL NODE
Fox and Bartels (1928)........	80	27.5%	26.3%	15%
Tull (1932)..................	134	21.0%	23.1%	19%
Eggel (1901)................	163	23.0%	14.0%	24.6%
	377	23.8% +	21.1% +	19.5% = 64.4%

It is seen that the three sites mentioned constitute 64.4 per cent of all metastatic foci. Unusual sites reported by Eggel were the gallbladder in eight cases; peritoneum and extrahepatic bile ducts in five; omentum and kidney in three; heart, cranial bones, and sternum in two; pancreas, spleen, diaphragm, stomach, colon, brain, thyroid, esophagus, and trachea in one each.

Among the fourteen patients herewith reported, metastases were more frequent in the hepatoma group, four out of six showing involvement of the lungs, portal vein, gallbladder, inferior vena cava, regional nodes, rib, and adrenal gland. Four of the eight cholangiomas showed metastases in the lungs, regional nodes, and widespread abdominal involvement.

Metastases outside the lungs and regional nodes are so unusual that Moon (19) in 1929 reported a case with rare skeletal metastases causing spontaneous fracture of the neck of the femur. Charache reviewed the literature in 1939 and found a total of eighteen cases with skeletal metastases, 1.6 per cent of the total number of cases of primary carcinoma of the liver reported up to that time. One of the cases at the University Hospital, A2314, showed rib metastasis.



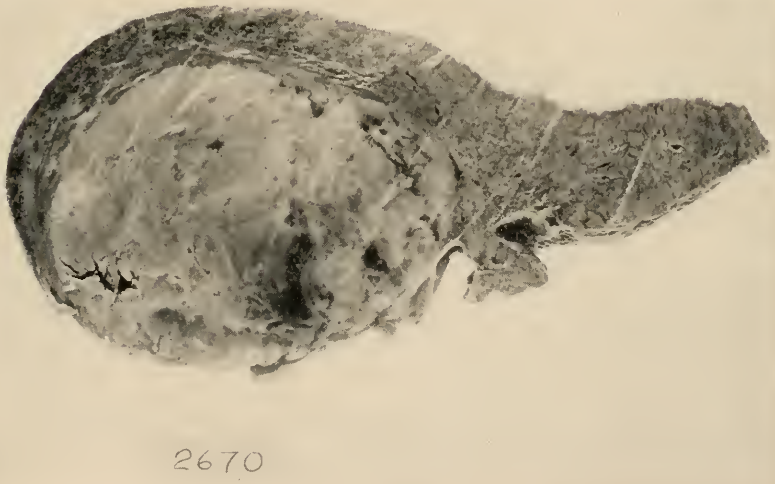


FIG. 1 (top). Multinodular hepatoma with cirrhosis showing tumor thrombus of an intrahepatic vessel. A2689.

FIG. 2 (bottom). Massive hepatoma with cirrhosis. A2670.

The comparative freedom from widespread metastases may be attributable to the short duration of the disease. The patient dies before distant metastases occur. The following chart is a pathologic summary of the fourteen cases at University Hospital:

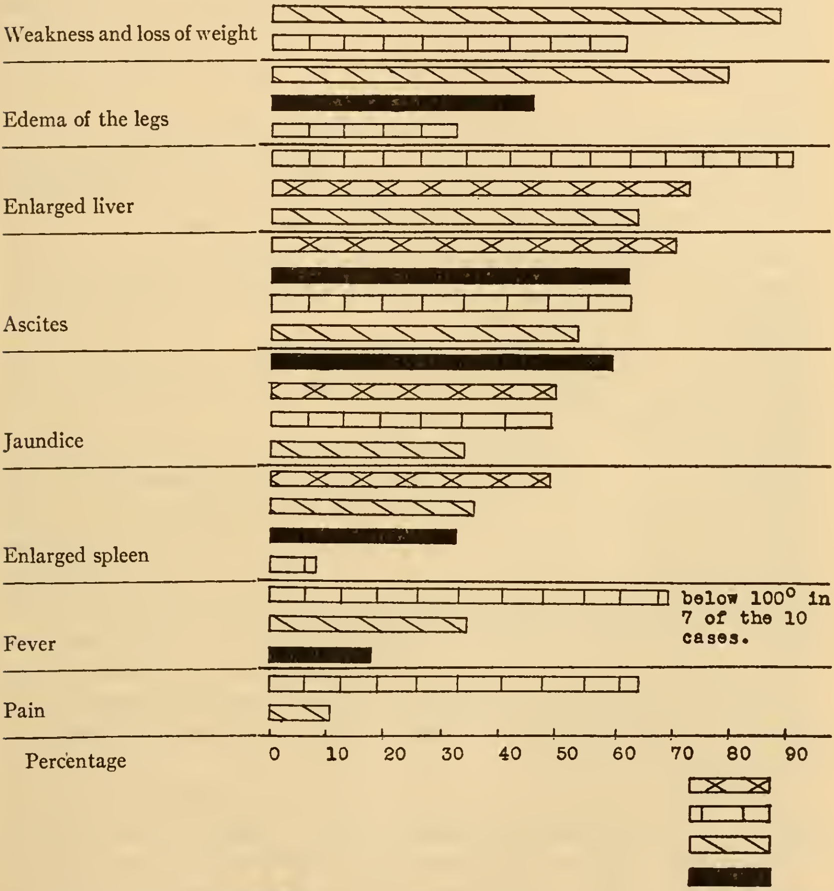
	NO. OF CASES	AVERAGE AGE	SEX	MULTINODULAR	MASSIVE	DIFFUSE	CIRRHOSIS	METASTASES
Hepatoma	6	61	Col. male, 4 Wht. male, 2	3	1	2	6 (5 True portal, 1 diffuse)	Lungs 2; portal vein 2; gall-bladder 1; inferior vena cava 1; regional nodes, rib and adrenal gland 1 each
Cholangioma	8	53.1	Col. male, 3 Wht. male, 3 Wht. female, 2	3	4	1	1 Diffuse	Lungs 3; regional nodes 2; widespread abdominal 1

With regard to the clinical aspects of this disease, primary carcinoma of the liver is often not recognized until autopsy for the reason that in most cases no definite symptoms point to the presence of a tumor. Usually all the symptoms are those of cirrhosis, i.e., vague gastrointestinal symptoms, ascites, edema of the legs, splenomegaly, cachexia, and hepatomegaly. There is little or no relationship between the extent of growth and the amount of disturbance of liver function. Malignant nodules may be palpable on the liver surface, especially after paracentesis, but this is not usual. The symptoms may actually be referred to the chest as the dome of the diaphragm is pushed up, thus obscuring the clinical aspects. A reliable clinical sign is the rapid decline of the patient, too rapid for cirrhosis.

Berman (3), who has seen and analyzed a large group of cases, 270, among South African races, classifies them on a symptomatologic basis as follows: 1) frank carcinoma in 64 per cent, where the signs and symptoms are referred to the liver from the onset in a patient in previously good health; 2) acute abdominal carcinoma, 9 per cent, in patients with latent primary carcinoma of the liver who suddenly develop an acute surgical abdomen following the rupture of carcinomatous nodules or erosion of blood vessels on the free margin of the liver; 3) the febrile group, 3.6 per cent, in patients with rapidly growing tumor of the liver and clinical manifestations resembling hepatic abscess; 4) metastatic carcinoma, 4.6 per cent, in which symptoms of metastases completely overshadow the primary lesion. Of 270 patients in his series, 265 were males, most of them forty years of age or younger.

In the yellow race a total of 134 cases was analyzed by Strong and Pitts (25) and Tull (28); all were Southern Chinese and only one was female. The average age was forty-four; the clinical course was rapidly downhill in two to three months, and weakness, ascites, edema of the lower extremities, and a palpably enlarged liver were the common findings.

In the following table are shown the clinical findings in 343 cases listed by Eggel, Tull, and Gustafson, together with the findings in the fourteen cases at the University Hospital.



Eggel (147 cases) ■; Tull (134 cases) ▧; Gustafson (62 postmortem findings) ☒; University Hospital (14 cases) ▥.

In addition to these findings, cachexia and prominent superficial veins of the abdomen were each seen in 21.4 per cent of the University Hospital cases.

It is surprising that in most reports on this disease no mention is made of the incidence of alcoholism in the patients, although all authors mention the factor of cirrhosis, and few reports give the incidence of syphilis. Gustafson's series showed definite alcoholism in 35 per cent and syphilis in 22 per cent. The incidence of cirrhosis in the same patients was 48 per cent. Seven or 50 per cent of the patients in the University Hospital series gave a history of alcoholism and of this number five had cirrhosis; four or 28 per cent reported syphilis; in five the serologic test for syphilis was positive and in one case it was doubtful. In this group with positive blood tests all had cirrhosis.

The symptomatology has been reviewed by Upham and Klotz (29) as follows:

Asthenia is somewhat characteristic. Weakness often forces the patient to seek treatment. Once present it becomes alarmingly progressive, so that the patient is forced to bed and remains there. Five of the fourteen patients at the University Hospital presented this symptom.

The loss of weight is moderate and may be unsuspected by the patient because of the retention of fluid. Nine of the patients in the University Hospital series complained of this.

Ascites is a constant feature, often hemorrhagic in nature. Six of the fourteen patients complained of swelling of the abdomen, and nine or 64 per cent developed ascites before death.

The pain is dull and aching, and usually localized to the right hypochondrium. It is worse on exertion and without relationship to food. There is an increase in its severity as a result of perihepatitis or a rapid stretching of the liver capsule. The pain is slight if deep-seated and more severe if it has spread to the diaphragm or to Glisson's capsule. Most observers report a higher incidence of pain than the 10 per cent found in Tull's series. In the fourteen University Hospital cases nine or 64 per cent presented this symptom; it was referred to the chest in one of the patients.

Jaundice is usually mild. Only three patients complained of this symptom but five were found to have definite jaundice on admission, and three more developed it later.

Other frequent findings are: hepatomegaly, edema of the lower extremities, vague gastrointestinal complaints, and a change in bowel habits. Anorexia was complained of by seven of the University Hospital patients, vague indigestion by six, and nausea by four. Three patients gave a history of abnormal stools; these were clay-colored in only one instance. Three patients complained of vomiting and one of hematemesis. One other patient had massive hematemesis after admission.

With regard to the laboratory findings, the following procedures are of interest. Values in the van den Bergh tests ranged from a trace to 30 mg.%. The icteric index varied from 17 to 266. Hemoglobin and red blood cell counts were made on all patients in this series and were within normal limits in six. The lowest values were 30 per cent hemoglobin and 2,000,000 red blood cells; the highest values were 110 per cent hemoglobin and 6,700,000 red blood cells. The white blood count ranged from 1400 to 18,000. There was a variable leukocyte count in these patients, depending on the inflammatory reaction in and around the liver.

Bromsulphalein tests frequently show retention of dye, but this is by no means constant. Obviously, it is not a good test in the presence of jaundice. The hippuric acid test is often normal even in the presence of marked liver destruction. Liver function tests were done on eight patients and were normal in three and impaired in five. Four bromsulphalein tests were abnormal and showed 3, 6, 8, and 40 per cent retention in one hour. Oddly enough, the patient with 40 per cent retention had no jaundice, whereas the others did have it. One hippuric acid test was abnormal, with a value of 1.4 grams. The results were normal in one other hippuric acid test and in two bromsulphalein tests.

The total serum proteins may be normal although the albumin-globulin ratio is frequently less than one. Total protein determinations were done on six patients and proved normal in four. The values in the other two were 3.4 and 4.7 grams per 100 cc. The albumin-globulin ratio was done on three and all were abnormal, with values of 2.0/6.4, 2.0/5.2, and 2.2/2.5.

Prothrombin time was determined on four patients in this series and only one was abnormal, this being 45 seconds.

The alkaline phosphatase level appears to be especially significant in primary liver carcinoma. If one excludes pathologic bone conditions, such as Paget's disease and metastatic bone disease, the elevation of the alkaline phosphatase level is usually associated with obstructive disease of the liver. It has been shown that increased serum phosphatase activity without hyperbilirubinemia can occur in incomplete obstruction. It is the belief of several investigators that an elevated alkaline serum phosphatase level without other chemical evidence of obstruction in the liver is indicative of malignancy in the liver. This test is a recent one and was not done on any of the cases reported in this series.

Roentgen ray studies were done on twelve patients with negative findings in six; in the other six the roentgenograms showed a mass causing pressure on the duodenum or hepatic flexure.

As an aid in diagnosis, as well as for biopsy, peritoneoscopy has been advocated. Aspiration biopsy over a palpable liver nodule also has been employed with success.

To differentiate primary carcinoma of the liver from cirrhosis is rather difficult. However, a nodular liver with areas tender to palpation, together with spontaneous right upper quadrant pain is ordinarily not encountered in uncomplicated cirrhosis. If an atrophic, cirrhotic liver begins to enlarge rapidly a malignant condition is to be suspected. A rising serum alkaline phosphatase level in the face of progressive liver damage seems to be suggestive of a developing malignant process in a cirrhotic liver.

Symmers (26) at Bellevue Hospital, correlating twenty years' experience in the necropsy rooms and in the wards, has successfully made clinical diagnoses based on the following criteria: 1) a male patient over thirty-five; 2) a large palpable tumor mass in the liver; 3) no primary tumor found elsewhere; 4) jaundice, usually mild; 5) ascites; 6) an otherwise unexplainable fever of mild degree.

The most important clinical finding in the differential diagnosis is the rapid decline, when the patient is much too ill for simple cirrhosis. In studying the numerous reports from the literature one is impressed by the fact that the clinical course is rarely more than three months in duration. The stay in the hospital for the patients in this series ranged from four days to two and one-half months; twelve patients were dead before two months. Eight patients had exploratory laparotomies, two with gallbladder procedures, and all but one died within a short time, from five hours to eleven days postoperatively. The other patient lived four weeks. The duration in the hospital for the nonoperative cases ranged from four days to seven weeks.

That there is something to be said for surgical intervention in these cases is brought out by several interesting facts. As early as 1899 Keen (15) reported a successful removal of the left lobe of the liver for a primary multinodular carcinoma. This patient was well at the time of his report one month later. In his paper Keen also described seventy-six cases of resection of the liver for tumors, both benign and malignant, sixty-three of which recovered sufficiently to leave the hospital. This gave a 14.9 per cent hospital mortality. The recurrence rate for the malignant growths, of course, was high. Nine out of fifteen recurred and caused death in from two months to two years. The average time was 7.2 months. No further follow up was made on the six cases labeled "recovery." Here then is evidence that liver resection did not mean death from hemorrhage or peritonitis even forty-five years ago.

Wallace (30) reviewed the literature up until 1941 and found twenty-nine cases in which partial resection of the liver was done for cancer. Of this number twenty-three survived operation; eight died of recurrence, and there was no later report of three; twelve patients have been reported alive and well after the operation, the time interval varying from two to five years. This author reported a case of his own, that of a twenty-three year old house-

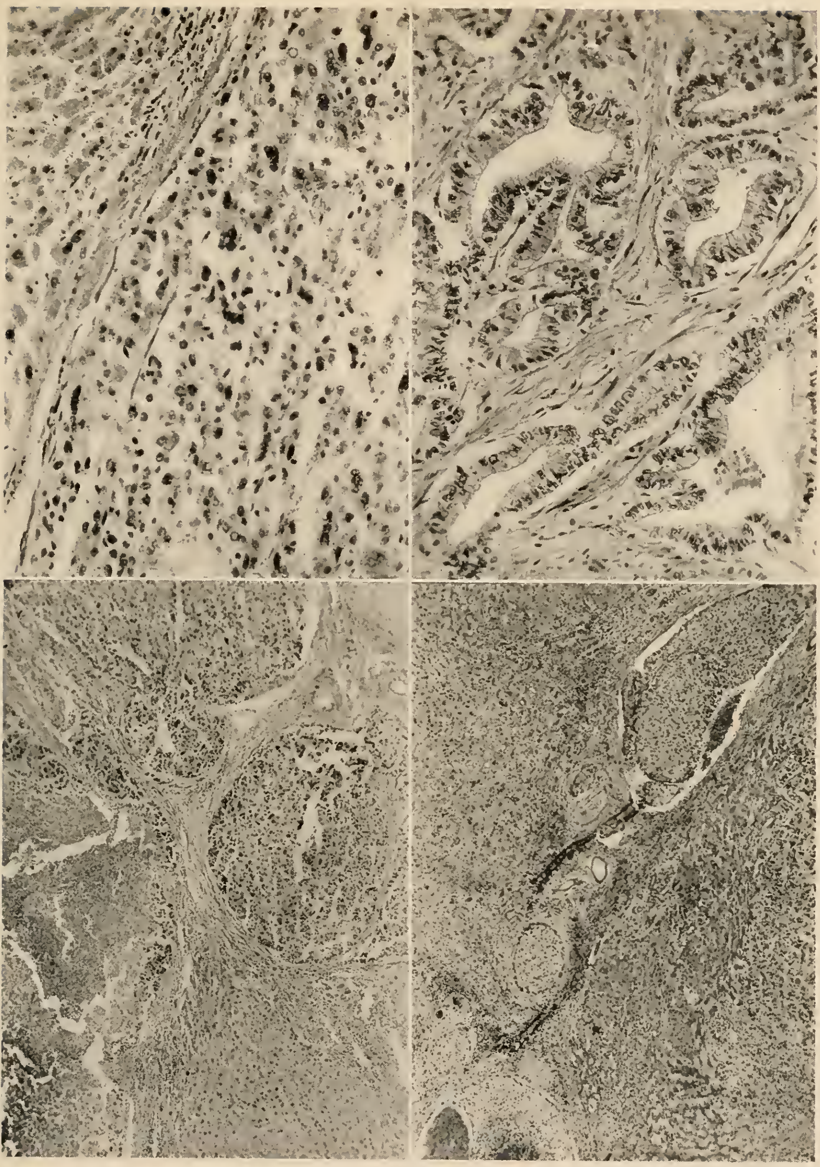


FIG. 3A (top left). Typical hepatoma. A3955.

FIG. 3B (top right). Typical cholangioma. A2719.

FIG. 3C (bottom left). Hepatoma showing cirrhosis and tumor necrosis. A3955.

FIG. 3D (bottom right). Cholangioma showing invasion of intrahepatic vessels. A3245.

wife, on whom he performed a successful resection of a large solitary hepatoma measuring 15 by 13 by 5 cm. in the right lobe of the liver. The patient was alive and well after more than five years. Wallace reported that a primary solitary hepatoma or cholangioma may be encapsulated and appear benign and grow slowly. It should be resected promptly together with a margin of normal liver tissue before it becomes too massive or multinodular.

As a matter of fact, Cattell (5) at the Lahey Clinic reported a case of carcinoma of the rectum with a solitary metastatic nodule in the liver measuring three and a quarter inches in diameter. This nodule was resected with a generous wedge of liver tissue at the same time the first stage abdominoperineal operation was done. The patient was alive and well one year later, 1940. Accordingly, an attempt at surgical cure is not out of the question in these cases, however heroic or radical it may seem.

The pertinent findings in the operative and nonoperative cases of the University Hospital series are shown in the accompanying chart.

NONOPERATIVE CASES

No. 1321. Age 38, colored male. Admitted 8–3–27, died 8–7–27. Died suddenly three days after bloody paracentesis, 2600 cc. Nonprotein nitrogen determination not reported. Autopsy revealed multinodular hepatoma with hemoperitoneum and hemothorax. The kidneys showed swelling of the tubular epithelium.

No. 2314. Age 63, white male. Admitted 11–4–35, died 11–26–35. Steadily declined in coma. Died in three weeks. Nonprotein nitrogen level ranged from 53 to 72 mg.%. Autopsy revealed diffuse hepatoma with metastases to regional nodes, fourth rib right, adrenal gland right. The kidneys showed vascular changes.

No. 2689. Age 67, colored male. Admitted 3–17–37, died 5–8–37. Declined rapidly, with weakness; was in semicomatose condition. On admission the nonprotein nitrogen level was 34 mg. %; no other determinations were made. Two paracenteses were done, 3000 cc. each. Autopsy revealed multinodular hepatoma with invasion of the portal vein and lung abscess. There were no exceptional kidney lesions.

No. 3245. Age 46, colored male. Admitted 11–27–39, died 12–12–39. Died in coma two weeks after paracentesis was done. The nonprotein nitrogen level was 60 mg.% four days before death. The ascites reformed. Amino acid determination was 6.8 mg.%. Autopsy revealed a multi-. nodular cholangioma, diffuse cirrhosis, metastases to the nodes, lungs, and tumor thrombus of the portal vein. No unusual kidney lesions were seen.

No. 3333. Age 45, colored male. Admitted 3–21–40, died 5–3–40. The patient vomited 500 cc. of blood on 5–2–40 and died twenty-four hours

AUTOPSY NO., ADMISSION AND DEATH	OPERATION	ANESTHESIA	DURATION POST-OPERATIVE	TYPE OF DEATH	NONPROTEIN NITROGEN LEVEL	ICTERIC INDEX, VAN DEN BERGH, AND LIVER FUNCTION TEST	AUTOPSY FINDINGS
No. 1713 Adm. 5-22-31 Died 6-12-31 Age: 83, wht. male	Exploratory laparotomy 6-1-31	Gas, oxygen, ether	11 days	Not stated	35 mg. % on admission, no others	I.I. 226 v.d.B. 30 L.F. not done	Multinodular hepatoma with invasion of portal vein; congestion and senile changes in kidneys
No. 2232 Adm. 5-17-35 Died 6-13-35 Age: 47, col. male	Exploratory laparotomy 6-13-35	Local (novocain)	5 hours	Coma; hypoglycemia; postoperative blood sugar 28 mg. %	23 mg. % on admission, no others	I.I. not done v.d.B. 2.3 L.F. not done	Massive cholangioma, right lobe; tubular epithelium of kidneys, swollen and granular; congestion of glomeruli
No. 2670 Adm. 2-8-37 Died 4-8-37 Age: 55, col. male	Exploratory laparotomy 3-9-37	Ether	4 weeks	Spiking fever with respiratory death	41 mg. % on admission, no others	I.I. not done v.d.B. no jaundice L.F. bromosulph. normal	Massive hepatoma with invasion of inferior vena cava and tumor embolism of the pulmonary artery; congestion of glomeruli; desquamation of tubular epithelium, kidneys
No. 2719 Adm. 6-7-37 Died 6-20-37 Age: 56, wht. male	Cholecystduodenostomy 6-15-37	Spinal and gas, oxygen, ether	5 days	Shock	32 mg. % on admission, no others	v.d.B. 15 L.F. not done	Massive cholangioma; postoperative hemorrhage; tubular epithelium of kidneys, swollen and pale
No. 2748 Adm. 7-8-37 Died 8-4-37 Age: 43, wht. male	Cholecystostomy 7-29-43	Gas, oxygen, ether	6 days	Coma and shock (?)	48 mg. % preoperative, no others	I.I. 65 v.d.B. 4.4 L.F. bromsulph. 8% retention 1 hr. .	Multinodular cholangioma and diffuse peritonitis; swelling and granularity of tubular epithelium, kidneys
No. 2777 Adm. 8-10-37 Died 9-17-37 Age: 50, wht. female	Exploratory laparotomy and biopsy of liver 9-15-37	Spinal	52 hours	Uremic coma	92 mg. % preoperative 130 mg. % postoperative	I.I. not done v.d.B. no jaundice L.F. bromsulph. normal	Multinodular, cholangioma; left hydronephrosis, tubular epithelium of kidneys, enlarged and swollen; fibrosis among the tubules
No. 3832 Adm. 3-7-42 Died 4-3-42 Age: 55, wht. female	Exploratory laparotomy 4-2-42	Spinal	24 hours	Coma; postoperative blood sugar within normal limits. Patient was diabetic	30 mg. % 2 weeks before death, no others	I.I. 28 v.d.B. 2.7 L.F. not done	Multinodular cholangioma; abdominal metastases; widespread tumor emboli, lungs; kidney congested; tubules showed cloudy swelling; lymphatics contained tumor cells
No. 3895 Adm. 8-11-42 Died 8-19-42 Age: 76, wht. female	Exploratory laparotomy and biopsy of liver 8-18-42	Spinal and gas, oxygen ether	24 hours	Mild shock and coma	34 mg. % on 8-12-42 no others	I.I. 18 v.d.B. 2.7 L.F. normal hippuric acid test	Diffuse nodular hepatoma; metastases to gallbladder; kidneys not examined

later. The nonprotein nitrogen level was normal. Autopsy revealed diffuse cholangioma with diffuse cirrhosis and ruptured esophageal varices. The kidneys showed scarring of the glomeruli and albuminous debris in the tubules.

No. 3955. Age 67, colored male. Admitted 12–8–42, died 12–25–42. There was a rapid decline, with the patient in a semicomatose condition. The nonprotein nitrogen level was high, 66 to 162 mg.%. Two weeks before death a paracentesis was done and 4000 cc. of bloody fluid was removed. Autopsy revealed multinodular hepatoma, portal cirrhosis, hemorrhage, and necrosis of the tumor nodule. There was no metastasis. Senile changes were noted in the kidneys.

In three of the six nonoperative cases there were abnormally high nonprotein nitrogen levels. These patients lived from two to three weeks. In four of the six nonoperative cases the patients were comatose or semicomatose for periods ranging from two to seven weeks before death. This does not include the coma that followed massive hemoptysis in Case No. 3333. The kidneys showed no striking lesions in these cases.

The nonprotein nitrogen determinations in two of the eight operative cases were higher than normal preoperatively. Four died in coma from five to fifty-two hours postoperatively. The nonprotein nitrogen determination was done postoperatively in only one instance and showed a level of 130 mg.%. There was no apparent cause mentioned for the comatose state in these patients, except a blood sugar level of 28 mg.% postoperatively in one patient who was given a local anesthesia. Spinal anesthesia was administered in the other three cases. No hyperpyrexia was noted in the comatose patients. Shock was the cause of death in two other patients, one associated with secondary hemorrhage and the other with peritonitis; these patients lived five and six days respectively. Of the other two, pulmonary tumor embolism caused the death of one; the cause of death in the other patient was not given.

It is unfortunate that more blood chemical studies were not made in the University Hospital cases, especially on the eight who were comatose or semicomatose. With their advanced liver disease and tumor necrosis they undoubtedly exhibited to some extent, at least, the hepatorenal syndrome, although they did not have more than mild degenerative changes in the kidneys.

Boyce (4) who has written an exhaustive monograph on the role of the liver in surgery, discusses all phases of liver deaths and liver-kidney deaths and lists a group of workers who studied twenty-one fatal cases of liver disease with jaundice. They were able to find a higher than normal nonprotein nitrogen level in seven cases; in only two of these were sufficient renal lesions seen at autopsy to account for the laboratory findings. The logical explanation in the remaining cases seemed to them to be that the degenerating products of liver necrosis and functional insufficiency were responsible for the inhibition of renal function. Often the disease was quite acute and, therefore, so brief that structural alterations in the kidneys had no time to manifest themselves.

SUMMARY AND CONCLUSIONS

1. The subject of primary carcinoma of the liver is reviewed and the available literature brought up to date.
2. The frequency of this condition varies in different races. In the white race it ranges from 0.13 to 0.5 per cent of all autopsies. The incidence is several times higher in the yellow and black races.
3. Two distinct cell types occur, the liver cell or hepatoma, and the duct cell or cholangioma. Grossly the growth is multinodular, massive or diffuse. Hepatoma is the more frequent and most growths occur in the multinodular form.
4. The condition is much more common in males, especially the hepatoma. The age group usually involved is from forty to seventy years old, but eighty-two cases have been reported authentically in children under sixteen.
5. Over 60 per cent of all primary carcinoma of the liver is associated with cirrhosis, particularly the hepatoma. Portal cirrhosis is the most frequent type.
6. Metastases from liver carcinoma usually are confined to the extrahepatic veins, regional nodes, and lungs; as a rule they are not large or numerous.
7. The common symptoms are: weakness, loss of weight, ascites, edema of the legs, hepatomegaly, and mild jaundice. Less often the spleen is enlarged and there is low grade fever. Pain is a variable complaint. All these findings occur with cirrhosis of the liver.
8. Laboratory tests are not always helpful; however, the liver function test and the alkaline phosphatase determination may prove significant.
9. The most important clinical finding in the differential diagnosis between cirrhosis and carcinoma of the liver is the rapid decline of the patient.
10. Early surgical extirpation of the cancer, or even a lobectomy before the growth becomes multinodular or too massive, is the only hope of a cure.
11. Fourteen cases from the records of the University Hospital and the Department of Pathology, School of Medicine, University of Maryland, are presented. These show the pathologic and clinical findings in each instance.
12. In eight of these fourteen cases the clinical course of the patient is marked by coma. This does not include coma associated with shock or in-

fection. The nonprotein nitrogen level in four cases was abnormally high. The relationship between liver disease, kidney damage and the hepatorenal syndrome is mentioned briefly.

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REFRIGERATION ANESTHESIA FOR AMPUTATION*†

WITH REPORTS OF ELEVEN CASES

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Whereas inhalation anesthesia depends largely upon the affinity of central nervous tissue for the given anesthetic and local anesthesia is a result of direct action upon the peripheral nervous structures, ice or refrigeration anesthesia is a result of action upon the individual cells of all tissues within the area being treated.

It has been observed that ice refrigeration maintains tissues and organs in an animated state. Portions of explanted heart growing and pulsating vigorously in vitro have been stored at a temperature of 32 F. for several days or sometimes weeks in complete inactivity, active growth and pulsation being resumed when the temperature was again raised to that appropriate for the animal concerned. It is reported that cold stored human corneal grafts take even better than fresh ones (1). Cannon and Burkett (8) in 1913 found that a piece of small intestine resumed muscular contractions following the return of temperature to normal in saline after a period of refrigeration. This indicated the myenteric plexus to be intact and still functioning.

Ice anesthesia then is an anesthesia of protoplasm and tissue fluid. It is a hibernation of cells or a true suspended animation of a part.

Fay (11, 12) and Smith (13) endeavored to use this method in the treatment of cancer, hoping that the actively metabolic cancer cells would die sooner than the less active, normal tissue cells and organs if the body or parts thereof were maintained at a constant refrigerated state.

Shortly following these experiments Allen began to work on refrigeration as an anesthetic and found that whole masses of tissue could be refrigerated successfully while still attached to the host. This work involved years of research and experiment upon various animals. Allen and others have done a great deal of work on the effects of temperature changes upon tissues and the metabolism of cells (2), tourniquets and their application (2, 3, 4), and the use of refrigeration for anesthesia (4, 5, 6).

An elevation above body temperature will naturally increase cellular metabolism, accentuate the tissue's need for oxygen and food, and increase the waste products which must be carried away, hence an acceleration in circulation must occur.

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The lowering of temperature has a converse effect and a diminishing circulation is the result. Metabolism ceases but, if the protoplasm itself is not frozen, activity may be resumed with the elevation of temperature.

A decrease in temperature to 32 to 37 F. has been found the most ideal for surgery. In order for this low temperature to be complete throughout the extremity being treated, it has been found necessary to completely shut off all circulation coming in from the warmer body circulation. The tourniquet is at present the most satisfactory means of doing this. Since an extremity with a temperature of 37 F. is at a metabolic standstill, no circulation is required.

From extensive experiments on types of tourniquets, tightness of application and the effects upon various tissues, it has been found that the most satisfactory tourniquet is an elastic round rubber, half-inch tube. This is drawn tightly in two turns about the leg so as to stop all circulation. Much could be written in regard to the experiments involved in this finding, but neither time nor space will permit such a discussion here (2, 3, 4, 5, 6).

The tissues are injured by repeated tight tourniquet applications in the absence of ice anesthesia in the following order: nerve, skin, and blood vessels. In the presence of adequate refrigeration these structures are not injured, as a rule, if care is taken in applying the tourniquet.

Advantages:

1. The method is simple and can be begun by anyone who can apply ice and a tourniquet.
2. It is a shockless and painless procedure preoperatively and postoperatively.
3. Healing is adequate since the metabolism of the stump is lowered by ice bags postoperatively so that a sluggish or limited circulation may maintain it.
4. Diabetes may be controlled better because the patient is free to eat pre- and postoperatively and does not suffer from the gastrointestinal upsets which so often follow other anesthetics.

Disadvantages:

1. The equipment is, as a rule, rather bulky, especially when cracked ice is used.

This method of refrigeration with amputation is used primarily upon extremities and is best suited for the more elderly patient who is a poor risk. A patient who is too ill from conditions such as pneumonia, heart failure, and diabetes to stand an anesthetic may be operated upon satisfactorily under lowered temperature.

A patient who is an extremely poor risk may have a badly infected or gangrenous foot. Once a tourniquet is satisfactorily applied the leg is physiologically amputated. The patient is no longer absorbing toxins from the area and under proper refrigeration is free from pain. Time can be taken to improve his physical condition, that is, to give transfusions, intravenous fluids, and vitamins, control diabetes, and take other rehabilitating steps, and then amputate the next day or even later if desirable.

Brooks and Duncan (10) by experiments with the intradermal injection of virulent bacteria, and Allen (5) by injection of rat feces in the legs of animals have shown that refrigeration inhibits the cells and bacteria. However, the toxins can still unite with the protoplasm and diffuse so that a rapid necrosis and gangrene occur with removal of the cold. Hence in the presence of infection, refrigeration is never to be prolonged unless the appendage is to be amputated.

In this hospital the procedure has been used only for amputation purposes. The patients chosen presented a variety of conditions, and some of them would have withstood general anesthesia. However, the refrigeration was used to become acquainted with the method and satisfactory results were obtained.

TECHNIC

The two main factors in refrigeration anesthesia are the proper application of the tourniquet and the placing of the ice. If complete and satisfactory anesthesia is not obtained it is because one of these details is faulty. Care must be taken to plan the amputation and tourniquet levels in advance because the surgeon must have ample room between his tourniquet and amputation sites for clean-up and flap formation.

Equipment:

1. Two thirty-six inch lengths of half-inch rubber tubing.
2. Strong clamps, Kocher's.
3. A box, metal lined, sufficiently long to hold a leg and with a deep notch at the proximal end to accommodate it.
4. A plentiful supply of cracked ice.

It has been found that the application of a tourniquet causes discomfort and sometimes quite a bit of pain. If the skin first is chilled with ice for twenty to thirty minutes the application is practically painless. Some patients may be slightly nervous from the thought of the forthcoming amputation and should be given preoperative sedation.

A supracondylar amputation to be done for gangrene of the foot will serve to illustrate the correct procedure to be followed. First, the lower leg is encased in ice to the patella for a half-hour (Fig. 1 A). The leg is then elevated to drain the blood from the extremity, unless considerable infection is present. While the leg is still elevated the tourniquet is applied below the knee (Fig. 1—T_1). This consists of a half-inch rubber tubing which is wound about the leg tight enough to cut off all circulation and reinforced with a second turn upon itself. The tubing is then clamped so that it cannot slip. Once the tourniquet is applied the leg is lowered and again encased in ice as before.

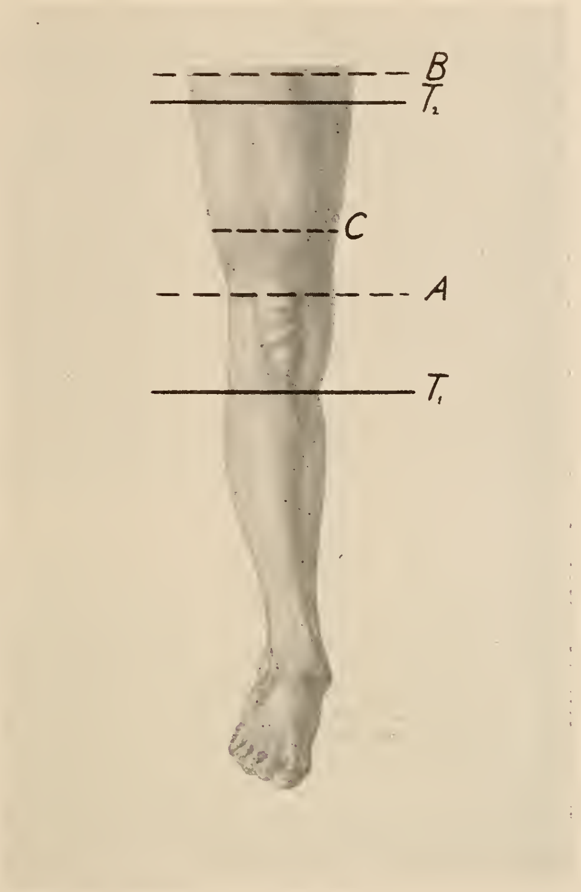

FIG. 1. A. The first ice level.
T_1. First tourniquet applied one-half hour after the ice was used.
B. The second ice level begun a half hour before the application of the second tourniquet as shown in T_2.
T_2. Second tourniquet applied approximately three hours before the operation.
C. Amputation level.

This tourniquet must be applied about an inch below the level at which the ice has been in order to be painless. When this has been applied the leg is physiologically amputated. Since the actual amputation is to be done above the knee, the tourniquet can be left on indefinitely while the condition of the patient is being improved. By this time the skin and tissues proximal to the knee are clearing themselves of unhealthy lymphatic drainage from the foot below and will therefore make a more satisfactory closure.

Three and one-half hours prior to the time of operation the ice level is moved well up the thigh (Fig. 1 B) so that a second tourniquet may be placed far enough above the amputation site to insure the surgeon freedom of movement (Fig. 1—T_2). One-half hour later the second tourniquet is applied well up the thigh and the leg is then repacked in ice.

Experience has shown that a low or midthigh amputation requires two and one-half hours of refrigeration with a tourniquet, two hours for the upper third of the leg, one and one-half hours for the lower third, and one hour for toe or metatarsal amputation.

Before the patient is brought into the operating room the ice is removed from around the leg and uncovered ice bags are applied all about the extremity.

The amputation site is cleaned in routine fashion with iced solutions, and iced saline is used throughout the operation. The larger vessels may ooze a little dark blood during this procedure. All visible ones are clamped and ligated. The sciatic nerve is isolated, injected with alcohol, and amputated. The tissues and muscles are retracted proximally, the lower femur sawed through, and the edges filed smooth.

The proximal tourniquet is not removed until the vessels have been tied securely and the muscles sutured over the exposed femur. Once the tourniquet is released the anesthesia rapidly wears off as a result of the warming of the part from incoming circulation. Only about ten minutes of anesthesia remain for the closure of skin flaps. In the absence of infection the stump is closed without drainage and silk is used throughout. If the problem of infection is present or the vitality of tissue near the stump is questionable, a guillotine operation is done and the area allowed to heal by granulation. The skin may later be closed over this.

When the operation is completed the stump is covered with a light dry gauze dressing which is fastened in place with adhesive strips and surrounded by five or six uncovered ice bags to maintain a reduced temperature.

The postoperative maintenance of reduced temperature has several advantages. 1) The agglutination of the skin edges and sealing of the suture lines are slowed up and hence drainage of serum can occur for a prolonged period of time about the sutures. This decreases the amount of postoperative swelling and tension on tissues already deficient in circulation. 2) Metabolism of the stump is lowered. In an arteriosclerotic leg poor circulation is evident and the site of amputation is already inadequately supplied. No increase in circulation is possible and, in view of operative trauma, the sloughing of suture lines could well occur. Therefore, if the metabolism of the cells and healing is slowed down considerably by lowered temperature, no increase in circulation will be needed. The metabolism is lowered to accommodate the limited circulation. 3) A decrease of swelling and tension results in slight postoperative discomfort. 4) There is less chance for postoperative hematoma.

The ice bags are removed one by one over a period of several days. Profuse serosanguineous drainage will often be seen on the original dressing, but this is to be expected and is desirable for the reasons previously described. Healing is a trifle prolonged in these cases and sutures are removed on the tenth to twelfth postoperative day. In all of the cases herein reported which were closed at operation, healing proceeded by first intention.

After the operation the patient is cooperative and usually comfortable. The same schedule of meals and medication is resumed. Several of these patients were sitting up in wheel chairs the day after the amputation.

However, if faulty technic is used in applying the tourniquet or the ice, the patient may have some discomfort during the actual operation, especially when the sciatic nerve is cut. Such a patient will require a small amount of sodium pentothal anesthesia and the postoperative course will be altered accordingly.

The following is a brief report of the cases on which refrigeration was used as an anesthesia for the amputation of limbs.

CASE REPORTS

Case No. 1: I. M., No. 53,758, was the first case in which refrigeration anesthesia was used at the University Hospital. The patient, a 40 year old colored female, was admitted on July 24, 1942 from the accident room with a massive, severe infection of the entire left forearm in association with diabetes. The entire arm was necrotic and the infection extended through all fascial planes and muscles. A culture was made which showed hemolytic staphylococcus. No gas-forming organisms were present.

The patient was toxic and listless, with a temperature ranging between 101 and 102 F. The diabetes was difficult to control and several attempts at incision and drainage were unsuccessful. The infection extended along the entire left forearm and into the upper arm. Early on the morning of August 7, 1942 cracked ice was placed about the left arm to just above the elbow and a tourniquet snugly applied. The patient's temperature dropped from 101 to 98.6 F. in three hours. She became extremely hungry for the first time since admission and was given food.

The ice level was moved high over the shoulder about 1:00 p.m. and a tourniquet tightly applied shortly thereafter as high as possible upon the shoulder. There was no pain with the amputation at 4:00 p.m. until the proximal tourniquet slipped off and the brachial artery began to bleed. This was readily clamped but the stump became painful at the brachial plexus. Only 0.1 gram of sodium pentothal was administered and the patient was returned to her room in excellent condition and wide awake. She was fed shortly after her return.

In spite of the fact that a guillotine amputation had been done about one inch distal to the head of the humerus, several areas of infection pocketed off above and required two further operations. A general anesthesia was given for these procedures and each time the patient suffered considerable shock. However, the healing and granulating proceeded satisfactorily when she was finally discharged.

Case No. 2: B. B., No. 58,659, a 40 year old white male was admitted on January 15, 1943 with a diagnosis of thromboangiitis obliterans of the right leg. In October, 1941 a sympathectomy had been done with some relief of the symptoms.

On admission the lower half of the right leg was dusky in color and tender to palpation. No pulsation could be felt below the popliteal artery. The temperature was 99 F., the pulse rate 110, and respirations were 22 per minute.

On January 17, 1943 a tourniquet was applied just below the right knee and the patient began to have considerable pain. Ice was packed about the lower leg to the knee and he soon became more comfortable. The ice level was raised on the thigh at 6:00 a.m. on January 18, 1943 and one hour later a second tourniquet was placed about the upper third of the thigh. At 10:25 a.m. a midthigh amputation was done and the stump closed. Since the patient appeared rather anxious 0.5 gram of sodium pentothal was administered.

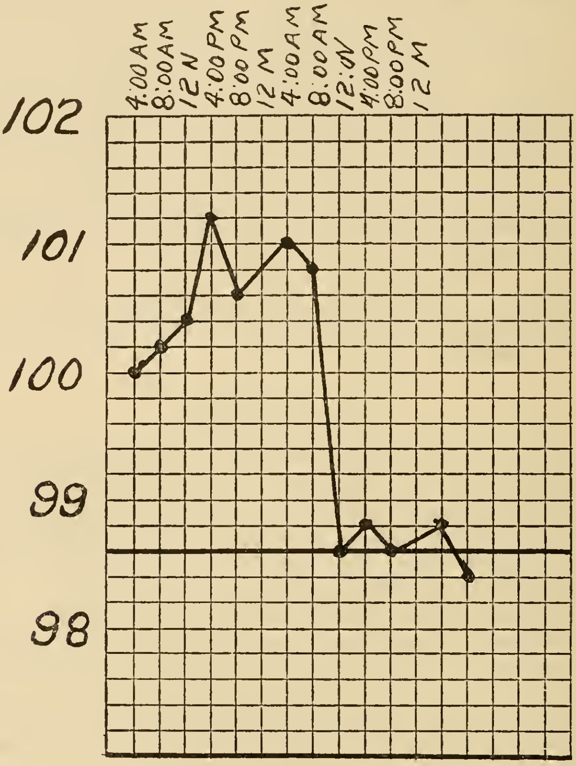

Fig. 2. Marked drop in temperature of Case No. 1 with application of ice and tourniquet.

His temperature on the first postoperative day rose to 104 F. and was associated with severe pain in the right upper thigh, with tenderness at the saphenofemoral junction. The administration of sulfathiazole was begun. The patient developed substernal pain on the morning of January 21 and became cold, clammy, and dyspneic. He was thought to have a pulmonary embolus and was placed in an oxygen tent. Heparin and dicoumarin were given. The patient died on January 22, 1943.

Autopsy findings No. 3976: Thromboangiitis obliterans; moist gangrene of amputation

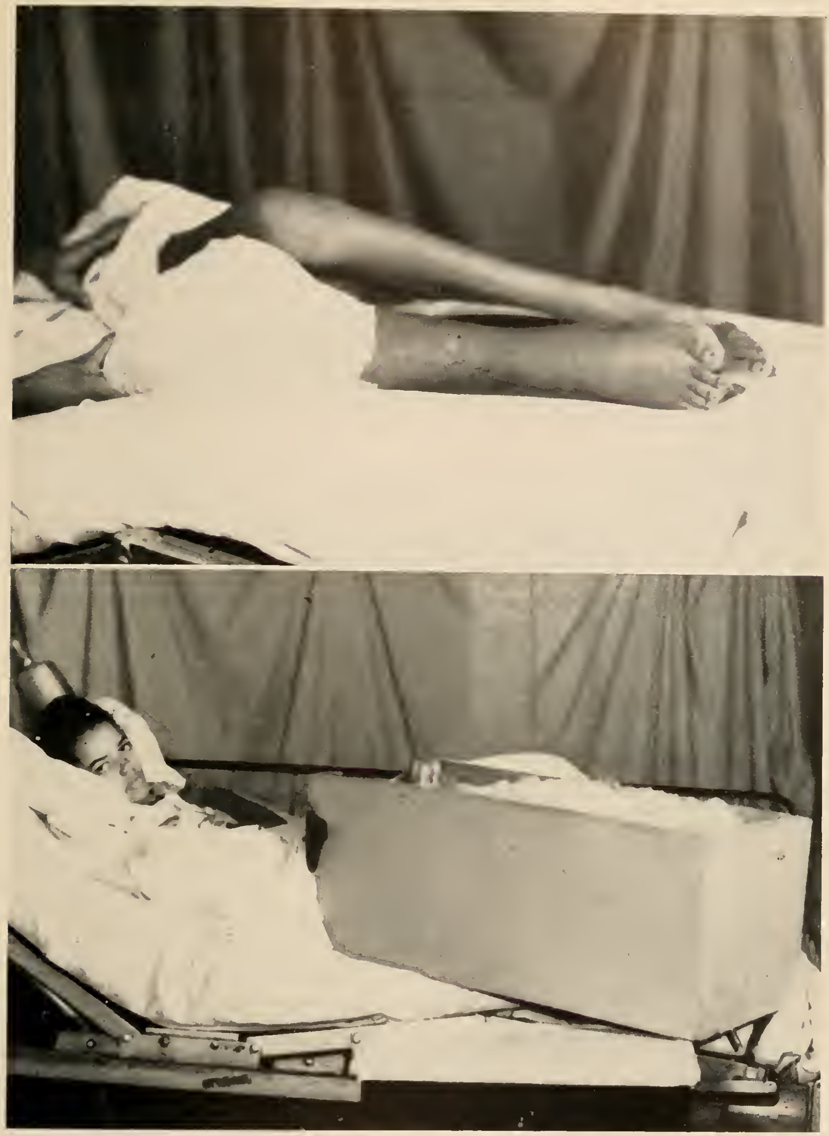

FIG. 3. (Upper.) The patient in Case No. 5 shows an osteosarcoma of the knee with sinus and considerable swelling of the leg. The result of a biopsy of the inguinal gland was reported as normal.

(Lower.) The same patient shortly after the tourniquet had been applied. Ice was used for a half hour before applying the tourniquet.

stump of right thigh; thrombophlebitis of deep and superficial veins right thigh; generalized arteriosclerosis; cardiac hypertrophy; congestion of the lungs, liver, spleen; old pleural adhesions.

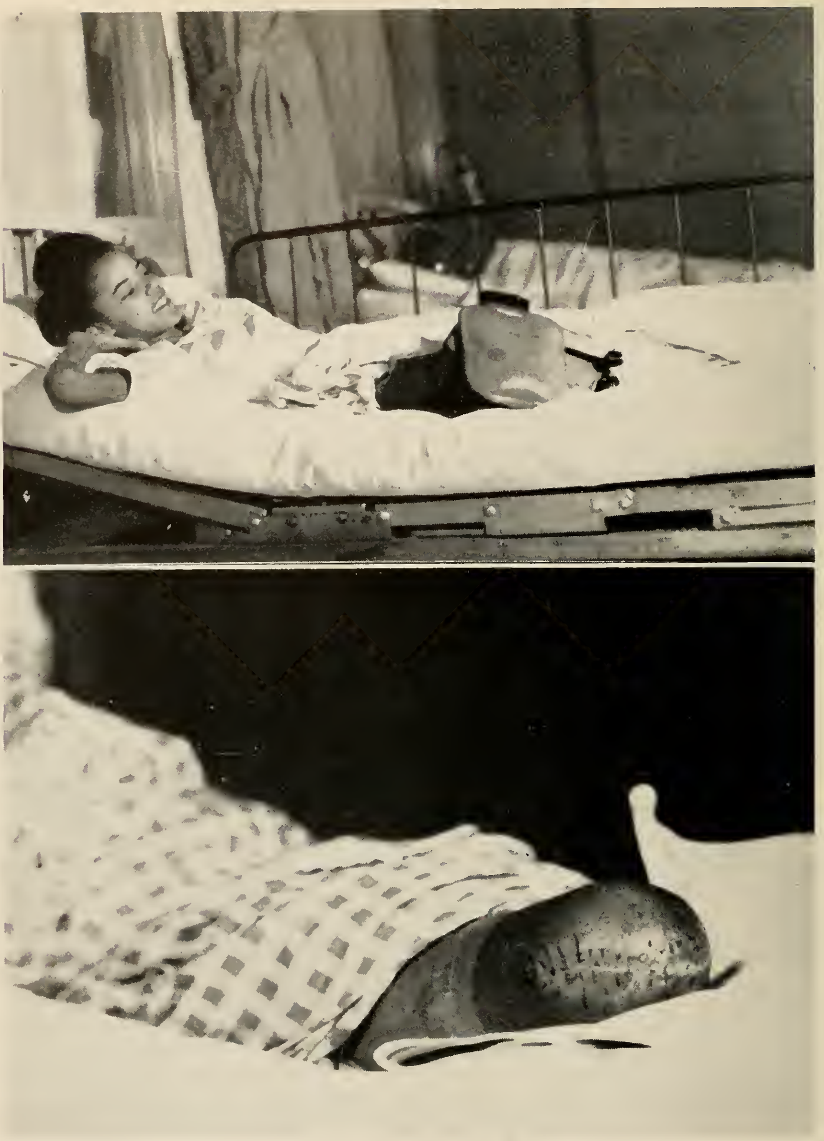

FIG. 4. (Upper.) M. B., Case No. 5, one hour after returning from the operating room. The ice bags have been placed about the stump to maintain the lowered temperature.

(Lower.) The appearance of the well healed stump prior to the patient's discharge. Silk was used throughout and there was no drainage.

Case No. 3: M. P., No. 50,382, a 41 year old colored female, was admitted on March 18, 1942 with a compound, comminuted, macerated fracture of the right lower leg. Prolonged conservative treatment with multiple operations was of no value, and a chronic progressive osteomyelitis continued in the tibia, fibula and foot. On August 29, 1943 a supracondylar amputation of the right leg with ice anesthesia was done and the stump closed with silk. The tourniquet was removed before closing the muscle flaps and she soon began to complain of discomfort. Two-tenths gram of sodium pentothal was given for sedation. The postoperative course was uneventful, the healing being by first intention. The patient was discharged fourteen days after operation.

Case No. 4: W. N., No.57,420, a 76 year old white male, was admitted on November 29, 1942. The right arm was cold and the hand cyanotic. No blood pressure or pulse was present in the right arm. In the left arm the blood pressure was 90 mm. of mercury systolic and 70 mm. diastolic, with a fibrillating pulse rate of 135. He was in poor condition and was thought to have Mönckeberg's sclerosis with auricular fibrillation, and an embolism to the right brachial artery.

The patient's temperature was 101 F. when the arm was placed in ice but this dropped to 99 F. the next morning. A guillotine amputation of the right midupper arm was done on December 7, 1942. The patient fell asleep during the actual sawing of the bone and did not require any supplementary anesthesia. The stump healed well with transient discomfort about the tourniquet site. He was discharged on January 2 in good condition, with a healthy granulating stump.

Case No. 5: M. B., No. 57,661, a 16 year old colored female, was admitted on December 7, 1942 with osteolytic osteosarcoma of the right knee and tibia. On December 11 a biopsy of the right inguinal glands was reported as normal. On December 18, a biopsy of the right knee through a sinus tract resulted in extensive hemorrhage and a pathologic report of osteosarcoma.

A midthigh amputation with ice anesthesia was done without any accessory anesthesia and closed with silk. The postoperative course was uneventful. On the second day the patient was sitting in a wheel chair and eating well. She was discharged and the stump healed by first intention.

Case No. 6: H. C., No. 58,247, a 35 year old white female, was admitted on December 31, 1942 with chronic, progressive osteomyelitis of the left foot and lower leg. The patient also was found to have a low spina bifida occulta and was decidedly obese. On January 7, 1943 a low thigh amputation was done with accessory anesthesia. The postoperative course was accompanied with some discomfort caused by bruising at the proximal tourniquet site, possibly because of the obesity of the patient. However, the healing proceeded by first intention without necrosis.

Case No. 7: M. Z., No. 58,776, a 60 year old white female, was admitted on January 19, 1943 with an infection of her left foot of several months' duration and a history of diabetes for the past five years. Her temperature was 101 F., the pulse rate was 120, and the rate of respiration was 24 per minute. The blood sugar level was 238 mg. per 100 cc., carbon dioxide combining power 43 volumes %, sugar in the urine was 4 plus, and acetone was positive.

She was placed upon a diabetic diet, with insulin injections, administration of sulfathiazole, and application of hot wet dressings. The infection of the foot failed to improve and on January 26 the foot was incised and drained. The infection was found to involve all bones and tendons of the foot and her condition still was unsatisfactory. On January 30, 1943 a supracondylar amputation was done without accessory anesthesia. The stump was closed with catgut. A slight wound infection developed postoperatively but the diabetes slowly improved and was brought under control. She was discharged on February 28 with a nearly healed incision.

Case No. 8: W. H., No. 59,345, a 17 year old white male, was admitted for elective open operation for the correction of a deformed right foot. Postoperatively the patient's temperature was much higher than normal and the typical odor of gas bacillus infection over the operative site developed. Blood cultures revealed a septicemia of the same organism. He was given sulfanilamide and other treatment, but failed to improve.

An amputation with refrigeration anesthesia was decided upon and satisfactorily done in bed on February 26, 1943, with only a small dose of sodium pentothal given mainly because of the patient's apprehension. A guillotine amputation of the upper tibia and fibula was done. The boy's postoperative course was uneventful and he was discharged with a healthy granulating stump.

Case No. 9: F. McC., No. 60,696, a 60 year old white male, was admitted on March 30, 1943 with a large Marjolin's ulcer following a thirty-five year course of chronic osteomyelitis of the right upper tibia and fibula. On April 13 a supracondylar amputation of the right leg was done and the stump closed with silk. The patient was seated in a chair the next day. The postoperative course was uneventful, with primary healing.

Case No. 10: H. M., No. 63,935, a 59 year old white male, was admitted with massive, chronc ulceration of the left shin and anterior leg of five years' duration. The leg was swollen and caused the patient to remain in bed most of the time. Conservative treatment had been of no value and roentgen ray examination showed some unusual alterations in the tibia and fibula.

A supracondylar amputation with ice anesthesia was done and the stump closed with silk throughout. This patient required a small amount of pentothal because of insufficient tightness of the tourniquet. The postoperative course was uneventful until the patient fell squarely upon the stump on the eighth postoperative day. This caused a small hematoma which cleared up rapidly when a small opening was made through the incision and it was allowed to drain.

Case No. 11: J. McA., No. 64,854, a 66 year old white male, was first seen in the accident room following an auto accident. The entire lower right leg was macerated from six inches below the knee downward, and the bones of the leg and foot were comminuted and compounded all along their lengths. When first taken his blood pressure was 115 mm. of mercury systolic and 90 mm. diastolic; in twenty minutes it dropped to 90 mm. of mercury systolic and 60 mm. diastolic.

The right leg was encased in ice to the patella and in a half-hour a tight tourniquet applied. The blood pressure soon returned to 120 mm. of mercury systolic and 84 mm. diastolic, and the patient remained comfortable. After two and one-half hours of refrigeration, a high guillotine amputation was done through the tibia and fibula without discomfort. The muscles were closed over the bone stumps but the skin was left open. The patient progressed well and was allowed to sit up in a chair the second day.

The following are the results of refrigeration used for amputations:

Femur—7 amputations were done
- A. 5 of these were supracondylar
  - 4 healed by first intention; 1 tourniquet bruise in an obese white female with spina bifida
  - 1 slight wound infection, healing well
- B. 2 were midthigh
  - 1 healed by first intention
  - 1 died, autopsied

Upper tibia and fibula—2 guillotine amputations were done
  - 2 healing well

Humerus—2 guillotine amputations
1 healing well
1 subsequent operation because of continued pocketed infection

The possibilities of this procedure are as follows:

1. In cases of embolism of a large vessel, such as the femoral artery, there is much pain and only a limited amount of time is possible before operation is demanded if the leg is to be saved. If this leg could be packed in ice and its metabolism brought to a standstill the time before operation could be greatly increased.
2. In extensive macerating injuries in a patient in poor condition, refrigeration with the tourniquet application will often prevent or shorten shock.
3. Under refrigeration a patient can be treated for shock and the general condition improved with transfusions and other measures, if necessary, prior to amputation.
4. The war wounded could be placed in similar position, transported without shock, and arrive at a hospital ready for operation without any further preparation or anesthesia. This would only be of value in locations where ample ice could be obtained, such as at winter battle fronts.

CONCLUSIONS

1. A general discussion of refrigeration anesthesia is given.
2. A brief review of eleven amputations under ice anesthesia is outlined.
3. Some of the possibilities of refrigeration anesthesia are mentioned. However, further clinical work with this method is essential to uncover other procedures.
4. It is simple and safe.

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HÜRTHLE CELL TUMOR OF THE THYROID GLAND*†‡

With Case Report

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Langhans in 1907 described what he considered a specific type of thyroid tumor in which the component cells were large, oxyphilic, and arranged in small alveoli or trabeculae. Tumors of this type subsequently have been described in the literature under the headings of Langhans' Wurchende struma, Getzowa struma, and Hürthle cell tumor.

The Hürthle cell tumor occurs most frequently in women. Fifteen of the seventeen cases collected from the literature were observed in the female. The majority of the reported cases have been in individuals in the fifth or sixth decade of life. However, Symmers (9) has reported a congenital Hürthle cell tumor in an infant six weeks of age. Three patients included in this group were negroes (7).

Aside from the presence of a mass in the thyroid gland, clinical symptoms are not consistent. In the reports that included clinical data, four patients sought treatment because of pressure symptoms. Four others complained of nervousness, irritability, sweating, tremor, and loss of weight. All of these were found to have an elevated basal metabolic rate (3, 7, 10).

The rate of growth of the Hürthle cell tumor is generally slow. Among the cases in which an accurate clinical history is given it is noted that in one instance the thyroid tumor had been present for nine years and in another for ten years before operative treatment was undertaken. The degree of malignancy as exhibited by these tumors is variable. Some are relatively benign, while others after a lapse of years may metastisize. A case reported by Haagensen (5) recurred nine years following removal and metastasized to the lungs two years later. Metastases were discovered in the vertebrae three years after the diagnosis of pulmonary lesions.

The gross appearance of the tumor has been rather similar in all reported cases. In five of the cases collected from the literature the tumor was well circumscribed, encapsulated, and readily separated from the surrounding tissue. In three other instances the tumor was adherent to the surrounding structures or trachea and difficult to enucleate (10, 3, 7). The neoplasm varies in size from rounded nodules measuring 2 to 3 cm. in diameter (10) to masses measuring 11 by 8 by 5 cm. (5). The tumor tissue itself may be

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described as a yellowish-pink mass streaked irregularly by fibrous trabeculae through which thick walled vessels course. The tissue bears little or no similarity to normal thyroid tissue and most frequently exhibits no colloid structure.

The microscopic appearance of this type of neoplasm is characterized by dense, compact aggregates of large polyhedral or irregular cuboidal, oxyphilic cells presenting central nuclei that contain finely granular and coarsely granular chromatin. Throughout the tissue one sees infrequent fragmentary or incomplete acini which contain no colloid. Many of the cells are vacuolated. The vacuoles may displace and flatten the nuclei to one side of the cell membrane. Irregularity of size and shape of the acini, hyperchromicity of the nuclei, frequent mitotic figures, the variation of cell size, and invasion of the vessels are said to indicate a malignant variety. The latter feature was stressed by Martin and Elkin (7) as being the most frequent characteristic of malignancy.

The origin of the Hürthle cell tumor is not known with any degree of certainty. Many observers believe that the tumor develops from the Hürthle or interfollicular cell, a large oxyphilic, parafollicular cell, which is thought by some workers to be a normal constituent of the thyroid gland and which is said to possess the power to develop active thyroid acinar tissue. The existence of this cell is questioned, however. Maximow and Bloom (8) as well as Reinhoff supported the idea that the Hürthle cell is actually a tangentially cut follicular cell and that there are no interfollicular cells at all. Getzowa has suggested that the Hürthle cell tumor arises from the ultimobranchial body. Maximow and Bloom and Wegelin (11) proposed the concept that the Hürthle cell is a degenerating or dying thyroid follicle cell. They considered the staining characteristics of the cytoplasm and the morphology and staining characteristics of the nucleus to be evidence of involution. Eisenberg and Wallerstein (3) reported that the probable source of the Hürthle cell tumor is from parathyroid tissue. They pointed out similarities between the Hürthle cell and the pale oxyphil parathyroid cell of Welsh. The similarities, however, are said to be merely coincidental. Wilensky and Kaufman (10) suggested that the Hürthle cell represents a variant of neoplastic thyroid cells and recommended that tumors showing the Hürthle cell pattern be designated thyroid tumors with Hürthle cell change.

The administration of Lugol's solution and bed rest were recorded (3) in one other than the case reported here. Both patients responded satisfactorily with a depression of the basal metabolic rate. In the two cases reported by Haagensen (5), No. 10, E. F., and No. 11, G. S., the tumors were irradiated and were said to be slightly radiosensitive. Radium irradiation was undertaken in one case observed by Wilensky and Kaufman (10). They reported no recurrences in three years. Martin and Elkin (7) observed no recurrence in two years following irradiation. It appears that this short period following irradiation is an inadequate indication of the efficacy of irradiation because of the slowness of development and recurrence in this type of tumor.

CASE REPORT

T. J., (S.P. 45,892), a 49 year old white female, was admitted to the University Hospital with the complaint of a lump in the neck which had been present and growing slowly for the past three years. During that time she had lost twenty to thirty pounds of weight and had become irritable and nervous. She said that she preferred cold weather.

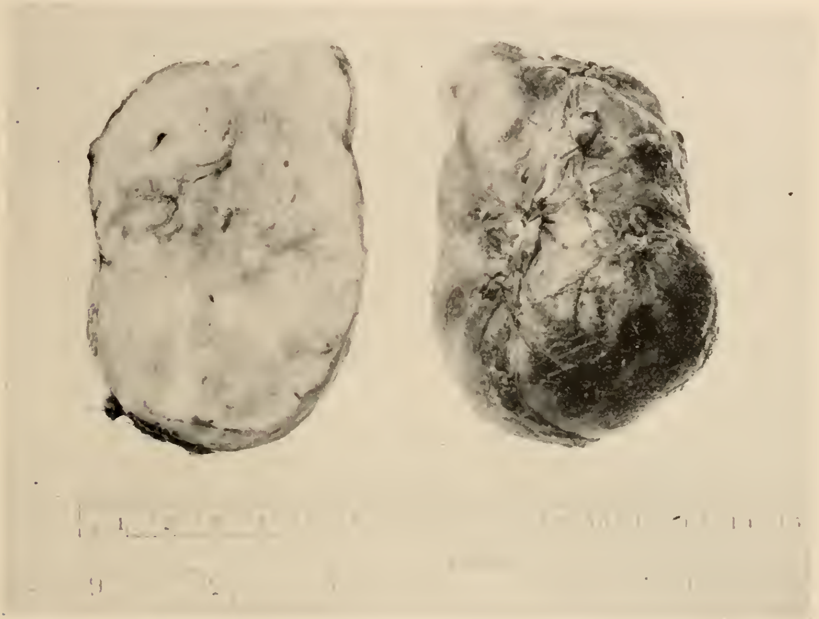

FIG. 1. Two views showing the gross appearance of the tumor (S.P. 45892).

A physical examination revealed the presence of a smooth, resilient, movable mass in the anterior part of the neck. The swelling was more prominent in the right side and extended downward to the suprasternal notch.

Roentgen ray examinations of the chest indicated no pathologic changes in the lungs. A mass was seen in the left of the neck which compressed the trachea and displaced it to the right side. No substernal extensions of this tumor were noticed.

Basal metabolic rates were determined and reported to be +11 to +19%. The blood calcium concentration was found to be 10.3 mg. %, phosphorus 4.7 mg. %.

Approximately one week after admission a thyroid tumor was removed. Grossly the specimen appeared as a somewhat lobulated, smooth mass removed by dissection along a distinct line of cleavage. Its consistency was uniformly resilient. It measured 9 by 7 by 6 cm. and weighed 187 grams after partial fixation. The cut surface was of a light, yellowish-pink color and was streaked by connective tissue which separated the tumor mass into incompletely demarcated lobules. A closer inspection of the tumor tissue revealed smaller divisions of variable sizes and shapes separated by thin connective tissue septa giving the surface an appearance closely resembling transected calf muscle. Two small cysts measuring 1 mm. and 2 mm. were seen. There was no visible colloid. No areas of hemorrhage or degeneration could be found. The tumor as a unit was enclosed by a distinct, heavy, fibrous capsule that could be separated with ease from the compressed thyroid tissue which formed the external surface of the specimen.

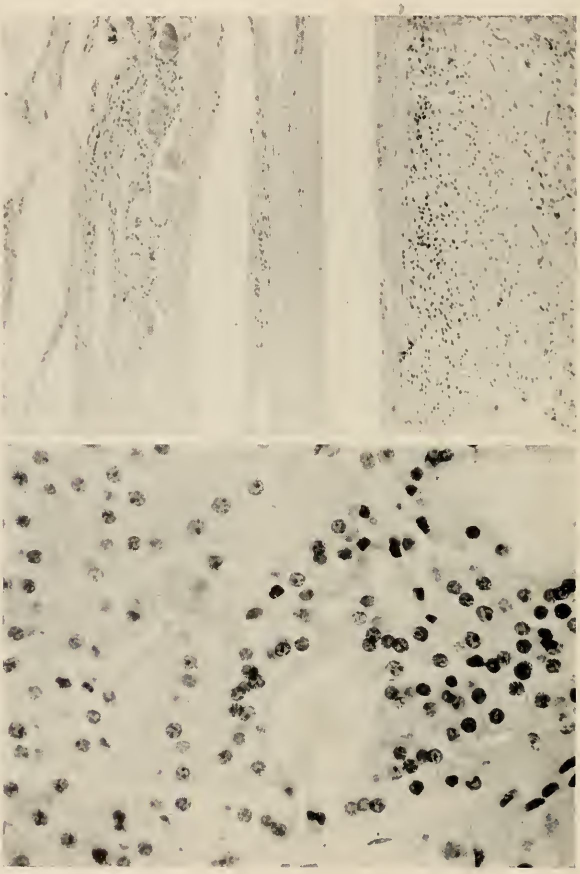

FIG. 2. (Upper.) A photomicrograph of the tumor, ×100.
(Lower.) A photomicrograph of the same tumor, ×430.

A microscopic examination showed the tumor to be made up of cords, columns, and sheets of closely packed, large polygonal cells. These cells were variable in shape. Some were hexahedral, some quadrangular, and others cuboidal. Many of the cells were distorted by compression. Their sizes varied from approximately 10 to 25 microns. A number of the cells presented cytoplasm of a clear deep red color; others were paler and granular.

The nuclei were also variable. Some of the nuclei contained finely granular chromatin, others were dense and lumpy, and in some there was coarsely granular but uniformly distributed chromatin. Few of the nuclei were rarefied and showed only a small number of irregular granules of chromatin in a relatively clear nucleus. In many of the nuclei, especially the latter type, nucleoli were visible. Mitotic figures were rare in this specimen.

The nuclei had a central position in some cells and were eccentric in those cells which were found to be vacuolated. The vacuoles in several instances had crowded the nuclei to one side and flattened them against the cell membranes. No fat was demonstrated in the vacuoles by the Herxheimer scarlet red stain nor glycogen by the Best carmine stain. Scattered throughout the tumor in an inconspicuous manner were cell groups which were arranged to form incomplete and irregular acini. Streaking through the section were many strands of fibrous tissue, some of which were thick and grossly visible and others which were barely perceptible. The cords of cells previously mentioned were arranged on both sides of these fibrous strands. Coursing through the thick septa were thick walled vessels; in the finer strands, smaller vessels of the capillary type were seen supplying this tumor rather abundantly with a blood vascular system. A distinct capsule which was seen on gross inspection was confirmed microscopically. Outside the capsule there was compressed thyroid tissue with a few colloid filled acini. A moderately heavy lymphocytic infiltration was seen in the stroma. No distinctive characteristics of toxic hyperplasia were discovered in the recognizable thyroid tissue surrounding the tumor capsule.

SUMMARY

1. The signs and symptoms of hyperthyroidism are inconstantly associated with the Hürthle cell tumor of the thyroid gland.
2. This type of tumor grows slowly and is of uncertain benignity in any case.
3. Those tumors that develop malignant characteristics are slow to metastasize.
4. Metastases are reported in the regional lymph nodes, lungs, and vertebral column.
5. No fat or glycogen is found in this tumor by appropriate stains.
6. A typical example of the Hürthle cell tumor is reported.

The author is indebted to Dr. Otto C. Brantigan for his permission to report the clinical features presented in this case.

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USES OF THE BRONCHOSCOPE*†

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INTRODUCTION

Bronchoscopy in its broader meaning includes the entire field of peroral endoscopy. The scope of peroral endoscopy embodies, besides direct tracheobronchoscopy, the fields of direct laryngoscopy, esophagoscopy, and gastroscopy. In the stricter sense of the word, however, the term bronchoscopy is limited to the specular examination of the bronchi. It is the narrower definition of the term which will be referred to in this description of the uses of the bronchoscope.

Originally bronchoscopy was concerned with the removal of foreign bodies from the air passages. Within recent times, however, this examination has achieved its greatest usefulness in the diagnosis and treatment of various diseases. Regions of the respiratory tract that were formerly invisible have been revealed through either direct, roentgenoscopic or fluoroscopic inspection. The trend toward the increased use of the bronchoscope is shown by the growing number of patients treated in the bronchoscopic clinics as compared to the cases in which foreign bodies are removed. Early bronchoscopy was used mainly in the removal of foreign bodies. Today approximately 98 per cent of the patients seen in the bronchoscopic clinics represent cases of disease, whereas only 2 per cent require the removal of foreign bodies (1). These figures emphasize the expanding use of the bronchoscope in the treatment of disease, despite the fact that the incidence of foreign body removal is today greater than ever.

HISTORY OF BRONCHOSCOPY

The early history of bronchoscopy is interrelated closely with the development of direct esophagoscopy and laryngoscopy (11). Bozini in 1795 introduced candlelight as a method of illumination in endoscopy. Stoerk, Bevan, Kussmaul, and Waldenburg employed crude esophagoscopes in their endoscopic work, but the first use of a rigid tube is attributed to Stoerk. Among others whose work paved the way for modern endoscopy were Killian, Kirstein, ven Hacker, Rosenheim, Gottstein, and Einhorn, and later Mosher and Jackson.

The first physician to pass a rigid tube into the larynx and trachea was Kirstein, who introduced this method in 1895. However, the "father of

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bronchoscopy" is generally alleged to be Gustave Killian. He was the first to remove a foreign body from the bronchus (1897) and thereby demonstrated the practicality of upper bronchoscopy. So-called inferior bronchoscopy, or the passage of a tube through an opening made by a tracheotomy, was introduced by Schroetter and Pieniazek.

The first successful bronchoscopy in the United States was done in 1898 by Coolidge in Boston. Early work on the removal of foreign bodies from the bronchi was carried out by Ingals in 1904 and by Jackson and Yankauer in the following year.

In 1905 Chevalier Jackson perfected a distally lighted tube which was one of the greatest contributions to the development of bronchoscopy. The distally lighted bronchoscope eliminated blind methods of bronchoscopy and made it possible to use narrower and safer tubes. Since Jackson's original contribution he has made numerous brilliant advances in this field and has brought bronchoscopic technic to its present high quality. Jackson's work has spread a knowledge of modern bronchoscopy throughout the world. The results of his labors have made his name synonymous with the greatest development of bronchoscopy in practically every medical center in the world.

In the field of medical bronchoscopy Plummer, Vincent and Moersch at the Mayo Clinic, and Jackson, Tucker and Clerf in Philadelphia have been outstanding. Yankauer, Imperatori, and Lynah were other pioneers who have done important work along this line.

USES OF THE BRONCHOSCOPE

The uses of the bronchoscope may be broadly classified as 1) diagnostic and 2) therapeutic.

I. Diagnostic bronchoscopy. This type of bronchoscopy is indicated in the presence of signs and symptoms relating to the trachea, bronchi, and lungs which are not accounted for by a specific and accurate diagnosis. Such signs include unexplained localized dullness, rales, paralysis of the recurrent laryngeal nerve or of the phrenic nerve, and the finding by roentgen ray examination of atelectasis, infiltration, cavitation, and mediastinal or root shadows. The symptoms are as follows: unexplained cough, expectoration, hemoptysis, wheezing, chest pain, and dyspnea. Bronchoscopy in diagnosis is also indicated in thoracic diseases in which deviations from the usual course are not satisfactorily explained (9).

Diagnostic bronchoscopy, like specular examination elsewhere, serves four main purposes (7):

1. A condition may be noted which may be remedied by the bronchoscopic speculum.
2. It may reveal a condition which requires irradiation or physical therapy.

3. A lesion may be found for which external surgery is indicated.
4. It may be negative.

It is difficult to establish hard and fast rules for diagnostic bronchoscopy. In actual practice bronchoscopy is indicated and may be used in the presence of any symptoms of respiratory disease, except in simple cases where an accurate diagnosis can be made by nonbronchoscopic methods. In spite of the limitations of direct bronchoscopy, unless the air passages are visually explored by the bronchoscope unsuspected lesions which are present may be missed easily.

Specific indications for diagnostic bronchoscopy. These may be listed categorically as follows:

1. Foreign body in the tracheobronchial tree
2. Bronchiectasis
3. Bronchial asthma
4. Pulmonary disease in general
5. Lung abscess
6. Post-tonsillectomic and postoperative pulmonary suppuration
7. Postoperative atelectasis
8. Unexplained hemoptysis
9. Tumors of the tracheobronchial tree, lung, and mediastinum
10. Unexplained cough
11. Broncholithiasis
12. Pulmonary tuberculosis
13. Recurrent pneumonia and unresolved pneumonia
14. Anomalies of the tracheobronchial tree
15. Compression stenosis of the trachea
16. Scleroma of the trachea
17. Bronchial stenosis
18. Syphilis of the tracheobronchial tree
19. Rare pulmonary infections
20. Pneumonography in lung and tracheobronchial disease
21. Fluoroscopy in foreign body removal

1. *Foreign body in the tracheobronchial tree.* A foreign body in the tracheobronchial tree is now recognized as a possible etiologic factor in most acute and chronic pulmonary conditions. The results of bronchoscopy in the removal of foreign bodies from the respiratory passages have been truly spectacular. At the present time bronchoscopy is successful in 98 per cent of the cases of foreign body disease (1, 4).

The symptoms and pathologic conditions produced by an obstructing foreign body in the air passages are variable and depend on the size, shape, and nature of this body; how long it has been in the respiratory tract; the relative area of lung involved; and the size and age of the patient. Rapid death may result from the sudden obstruction of the tracheobronchial tree by a large foreign body. On the other hand, a small, nonobstructive foreign body may produce no symptoms for a long period and then give rise to pathologic changes in the bronchi or lungs. The symptoms produced may simulate bronchiectasis, asthma, and similar conditions, unless the possibility of a foreign body has been eliminated by bronchoscopic examination. A vegetable substance in the tracheobronchial tract of an infant or child may cause considerable local inflammation and swelling associated with dyspnea, thus simulating other conditions unless ruled out by bronchoscopy. Complete obstruction of a bronchus by a foreign body may produce atelectasis and drowned lung; this may often be mistaken for empyema unless a bronchoscopic examination has been made to ascertain the presence of a foreign body.

In excluding the possibility of a foreign body it is necessary to take a careful history to rule out such signs as the asthmatoid wheeze, lateral shift of the mediastinum, cardiac displacement, and the signs of obstructive emphysema or obstructive atelectasis. These constitute localizing signs of a foreign body and definitely call for the use of the bronchoscope as a diagnostic aid. Other confirmatory signs are the limitation of expansion over the side affected, impaired breath sound sover the obstruction, the hyperresonance in emphysema, and the dullness or flatness of atelectasis and drowned lung. A movable foreign body in the trachea will produce such diagnostic signs as the "asthmatoid wheeze, audible slap, and palpatory thud" of Chevalier Jackson. Roentgenograms may be used to locate those foreign bodies which are opaque to roentgen rays.

After obtaining the history, making a physical examination, and taking roentgenograms for the location of a foreign body the patient may be prepared for diagnostic bronchoscopy. Careful preparation is necessary because of the mechanical problem presented in each case and because of the danger of forcing the foreign body farther down the tract. Furthermore, time is usually not an important factor since bronchoscopy is rarely an emergency procedure.

The technic to be used depends upon the special problems presented in each individual case. As an aid in deciding the method of procedure in removing foreign bodies with the bronchoscope, Chevalier Jackson has prepared so-called canned experience or tabulated data including 1) instruments used, 2) the method employed, and 3) results obtained in about 3000 cases of foreign bodies. From these prepared tables the bronchoscopist may select a parallel case to aid him in doing the bronchoscopy for removing a foreign body.

2. *Bronchiectasis.* Bronchoscopy is valuable in bronchiectasis chiefly for the purpose of ruling out obstructive lesions of the bronchi, namely, bronchial stenosis, foreign body in the bronchus, bronchial tumors, and

other similar conditions. Most cases of bronchiectasis possess definite indications for diagnostic bronchoscopy. Nevertheless, bronchography is superior to bronchoscopy in determining the presence and extent of the bronchiectatic process according to Kramer (9).

3. *Bronchial asthma.* Bronchoscopy is widely used in the study of bronchial asthma. In some cases of asthma the results of the bronchoscopic examination show an entirely normal condition between attacks. Other cases, however, indicate definite lesions in the bronchi, such as chronic bronchitis, bronchiectasis, and narrowing of the bronchial lumen. During an attack the lumen may or may not be narrowed. The mucosa is cyanotic and there is a tenacious obstructive secretion in the bronchial tree. Bronchoscopic studies in asthma should be made without an anesthetic to avoid stopping the attack before a diagnosis of bronchial asthma can be made.

4. *Pulmonary disease in general.* By far the greatest field for bronchoscopy lies in the diagnosis and treatment of pulmonary diseases. The value of a direct examination of the tracheobronchial tree is apparent from the fact that in almost all forms of lung disease the normal functions of ventilation and drainage are impaired or lost at some stage of the disease. Also, the normal lung defenses may be weakened in disease. The bronchial movements may be lost, the ciliary action destroyed or impaired by inflammation, and the cough reflex may be lost or disturbed by the collection and stagnation of secretions, thus leading to bronchial obstruction and the prevention of proper ventilation and drainage of the affected lung area. As a result, the bronchial obstruction may be the forerunner of such conditions as atelectasis, pneumonitis, bronchiectasis, abscess, and gangrene. With bronchoscopic aid these conditions may be more easily diagnosed and treated.

5. *Lung abscess.* Bronchoscopy is indicated here in ruling out a lesion in the bronchus and as an aid in locating and localizing the abscess. The pulmonary segments involved by the abscess can be mapped out visually by finding the branch of the bronchus which contains pus and has a foul odor. Surgical drainage may then be instituted following the advice given to the surgeon after bronchoscopy has located the lung lesion. If the pulmonary suppuration is of foreign body origin, the abscess almost always heals after the obstructing body is removed and sufficient rest and fresh air are allowed.

Thus bronchoscopy can be used to determine the cause of the lung abscess and to remove the foreign body, if such be the etiological agent. It can also be employed to diagnose both acute putrid lung abscess and chronic pulmonary abscess.

6. *Post-tonsillectomic and postoperative pulmonary suppuration.* A lung abscess following a tonsillectomy may have its origin in either the aspiration of infected tissue or septic materials, or in septic emboli carried to the lungs via the hematogenous route. Some instances of lung abscess are known to

be caused by the aspiration of infected bits of tonsil, infected teeth, or fragments of instruments or swabs carried directly from the oral cavity to the bronchi and lungs. Other cases indicate that the infection may travel from the pharynx to the regional lymphatics and into the veins, thence by septic emboli into the lung, where a suppurative process is started. Regardless of the route of infection, bronchoscopic aspiration is indicated immediately when cough and expectoration follow a tonsillectomy, or other operations on the pharynx or buccal cavity, provided there is no pleural involvement and provided surgical drainage is not indicated.

7. *Postoperative atelectasis.* The presence of a bronchial obstruction attributable to atelectasis following an operation calls for diagnostic bronchoscopy. Bronchoscopic findings in postoperative atelectasis reveal the true obstructive character of bronchial secretions in massive collapse of the lung.

8. *Unexplained hemoptysis.* Diagnostic bronchoscopy often is indicated in hemoptysis when the condition is not definitely the result of pulmonary tuberculosis, mitral stenosis, an aortic aneurysm, or a pulmonary embolus. The cause of the bleeding may be found on bronchoscopic examination to be varices, unsuspected syphilis, a malignancy, or tuberculosis of the tracheobronchial tree. The origin of hemoptysis in other cases may be a broncholith abrading the bronchial mucosa, a foreign body in the tracheobronchial tree, or a cartilaginous sequestrum. Still another type of hemoptysis which may be diagnosed bronchoscopically is so-called essential hemoptysis resulting from an abnormal fragility of the blood vessels of the bronchial mucosa. This condition usually is seen in women in whom irregular periods of hemoptysis are the only symptom. Gentle manipulation of the bronchus with the bronchoscope will demonstrate this condition.

9. *Tumors of the tracheobronchial tree, lung, and mediastinum.* Bronchoscopy is indicated for the diagnosis of tumors of the respiratory tract, both malignant and benign. It is also valuable in the removal of tissue for histologic examination in lung or tracheobronchial tumors. Bronchoscopic biopsy also is indicated where a tumor of the respiratory tract is suspected. Bronchoscopic examination also supplies the surgeon with information concerning the relation of a mediastinal tumor to the respiratory tract. The external removal of the tumor thus may be facilitated.

10. *Unexplained cough.* An unexplained cough is always an indication for bronchoscopy because of the various pathologic conditions which may be the cause of the cough. The possibilities are numerous; a few of these are malignancies, bronchitis, and bronchiectasis. A diagnostic bronchoscopic examination of the tracheobronchial tree always should be done to determine the etiology of the cough.

11. *Broncholithiasis.* Broncholiths may be diagnosed and removed

bronchoscopically. They form around a nucleus of silica, anthracotic pigment, pus, lymphoid tissue, and calcareous matter. The problem of removal is similar to the removal of a foreign body.

12. *Pulmonary tuberculosis.* Bronchoscopy in tuberculosis is indicated in the following conditions:

a. In cases of suspected tuberculosis where a positive sputum cannot be obtained. The bronchoscopic removal of secretions from the involved lung area frequently produces a positive sputum.
b. Persistent positive sputum in spite of adequate therapy calls for a bronchoscopic examination to determine the presence of bronchial tuberculosis.
c. Bronchoscopy is indicated before doing extensive surgery for pulmonary tuberculosis to confirm the presence of a bronchial lesion or of positive sputum in the opposite lung.
d. The type of bronchial lesion present can be ascertained by means of bronchoscopy if there is localized wheezing or localized atelectasis in pulmonary tuberculosis.

13. *Recurrent pneumonia and unresolved pneumonia.* Recurrent attacks of pneumonia are an indication for bronchoscopy if the same area of the lung is involved each time, to rule out any bronchial lesion. The same is true for persistent empyema. Bronchoscopy also is indicated in unresolved pneumonia, for unless the bronchoscope is used to drain the secretions the atelectatic lung may become fibrotic and bronchiectatic.

14. *Anomalies of the tracheobronchial tree.* Anomalies of the tracheobronchial tree are relatively rare. Among the anomalies which may be diagnosed bronchoscopically are congenital cystic lung, congenital esophagotracheal and esophagobronchial fistulas, cervicotracheal fistulas, congenital webs, tracheal diverticula, and laryngoptosis. Congenital webs may be revealed and cured easily by bronchoscopy.

15. *Compression stenosis of the trachea.* Among the numerous conditions that may cause compression of the trachea are goitre, aneurysm, malignancy, enlarged thymus in children, mediastinal tuberculosis, hypertrophied heart auricle, mediastinal and cervical lymphadenopathy, Hodgkin's disease, syphilis, tuberculosis, and leukemia. The result of the bronchoscopic examination is characteristically the finding of an elliptical or scabbard-blade lumen when the bronchus is at rest or during inspiration. Annular growths may produce concentric funnel-like compression stenosis.

16. *Scleroma of the trachea.* This is a stenotic process caused by the narrowing of the tracheal lumen by infiltration of the tracheal mucosa. Scleromata can be diagnosed by bronchoscopy.

17. *Bronchial stenosis.* Bronchial stenosis is the result of cicatricial contraction following a secondary infection of traumatic, luetic or tuberculous

lesions. The narrowing of the bronchus by scar tissue formation may be diagnosed by the bronchoscope.

18. *Syphilis of the tracheobronchial tree.* This is a rather rare condition. The lesions may be inflammatory, ulcerative or gummatous. Luetic stenosis may follow; hemoptysis may be a result. Tuberculosis or carcinoma may be associated with the luetic tracheobronchial lesion. The only definite method of diagnosis is by bronchoscopic biopsy.

19. *Rare pulmonary infections.* Infections of the lung, such as actinomycosis, blastomycosis, and leptothrix can be diagnosed by smears and cultures made from secretions aspirated from the respiratory tract with the bronchoscope.

20. *Pneumonography in lung and tracheobronchial disease.* One of the most valuable uses of the bronchoscope in diagnosis is in pneumonography, that is, in the introduction of radio-opaque substances into the tracheobronchial tree and the lung periphery for roentgen ray examination and study. The two best radio-opaque substances for pneumonography are bismuth subcarbonate and lipiodol (iodized oil). Insufflation of bismuth subcarbonate into the trachea and bronchi was recommended originally by Chevalier Jackson. Instillation of lipiodol into the diseased area of the lung for study was advocated by Forestier. Bismuth subcarbonate gives the best results for outlining the trachea and larger bronchi, whereas for studying the lung periphery and for dilatation of the smaller bronchi lipiodol is more satisfactory (2). The area of the lung, bronchus or trachea that is to be studied first can be cleared of secretion by the bronchoscope and the radio-opaque medium can then be introduced.

21. *Fluoroscopy in foreign body removal.* Fluoroscopic bronchoscopy for the removal of foreign bodies is indicated by the following conditions (1):

a. When the radio-opaque foreign body has invaded a part of the trachea or bronchus where it cannot be removed safely by direct bronchoscopy.
b. In cases where fluoroscopic aid can be given in two planes alternately by the double tube, double plane fluoroscope (10).
c. When a well trained bronchoscopist and fluoroscopist together have worked out a careful technic for foreign body removal.

For the removal of foreign bodies from the respiratory passages with the bronchoscope it is absolutely necessary to make use of the single and biplane fluoroscopes. The single fluoroscopic examination is limited to the determination of whether or not a foreign body, either opaque or nonopaque, is present in the respiratory tract. To detect an opaque foreign body is much simpler and the position of the object may be located easily by means of the fluoroscope. Nonopaque foreign bodies are more difficult to locate; the test depends upon the transparency of the lung, the position of the heart, and the action of the diaphragm. In addition, the fluoroscopic findings must be confirmed by roentgen ray examination in inspiration and expiration. The biplane fluoroscope is used to direct the instruments during the removal of a foreign body, both for opaque and nonopaque objects. Biplane fluoroscopy also requires close correlation of the findings with the roentgen ray results.

II. THERAPEUTIC BRONCHOSCOPY. The uses of the bronchoscope in the treatment of disease are classified in the following four main categories:

1. The removal of obstructing tissue.
2. The aspiration of tenacious secretions.
3. The dilatation of strictures.
4. The removal of obstructing secretions.

In the opinion of Chevalier Jackson (7) the removal of obstructing secretions is the most important of the general indications for therapeutic bronchoscopy. This may be made clearer by a review of the normal defense mechanisms of the lung and their connection with disease (1).

The normal defense mechanisms of the lung which enable this organ to ward off disease and to function properly are 1) bronchial movements, 2) ciliary action, and 3) the cough mechanism or reflex.

In diseases of the lower respiratory tract the bronchial movements are impaired and ciliary action is lost or impeded by inflammatory processes. As a result, the lower respiratory tract becomes filled with secretions which soon stagnate and produce bronchial obstruction. This obstruction impairs and ultimately will prevent ventilation and drainage of the lung area involved, thus rendering the cough mechanism ineffective. The eventual results of bronchial obstruction are variable in their pathologic forms. An obstructed bronchus will block drainage. If completely obstructed the result may be atelectasis with a drowned lung, then suppurative pneumonitis, and finally an abscess or bronchiectasis, depending on where the lesion is and how extensive the process may be. Thus it can be seen that bronchial secretions may be removed by the use of the bronchoscope, thereby freeing the cilia for normal action, preventing stagnation, and aiding the restoration of the cough reflex. Aspiration bronchoscopy, therefore, is of great importance in restoring the defensive mechanisms of the lung and thereby serves as a prophylaxis against disease of the lung.

Specific indications for therapeutic bronchoscopy. The following is a categorical list of the indications:

1. Lung abscess
2. Post-tonsillectomic lung abscess
3. Lung gangrene
4. Bronchial stenosis
5. Bronchiectasis
6. Bronchial asthma

7. Atelectasis and massive collapse of the lung
8. Acute tracheobronchitis
9. Sequelae of war gassing
10. Tracheobronchial diphtheria
11. Tumors of the tracheobronchial tree
12. Implantation of radon seeds
13. Spirochetosis of the bronchi
14. Endobronchial medication

1. *Lung abscess.* A lung abscess of foreign body origin usually heals without local medication after removal of the foreign body and allowance for rest.

An acute pulmonary abscess from other causes requires bronchoscopic drainage plus bed rest and postural drainage. In addition, gentle dilatation of the swollen, narrowed bronchus leading to the abscess is helpful. Obstructing granulations should be crushed and removed. If the abscess does not communicate with the bronchus the bronchoscope may be used to puncture the abscess cavity under the fluoroscope. However, this procedure is dangerous and rarely followed.

In general it may be said that while bronchoscopic treatment of an acute lung abscess is beneficial, external surgery usually is much more effective, Spontaneous cures result in 35 per cent of the cases and bronchoscopic cures in 52 per cent, whereas thoracotomy cures about 95 per cent of the cases.

Bronchoscopic drainage permits localization in abscesses which cannot be localized so that surgical drainage can be done.

Chronic pulmonary abscesses often may be treated satisfactorily by using bronchoscopic lavage with saline, removing secretions by aspiration, and instituting endobronchial medication. Bronchoscopic suction-irrigation also is used widely. In spite of good results in some instances, many cases are intractible and rapidly fatal. Bronchoclysis or the slow dripping of medication down the tract is also a valuable adjunct.

2. *Post-tonsillectomic lung abscess.* Excellent results are achieved by bronchoscopic aspiration of the infected secretions, often with quick recovery.

3. *Lung gangrene.* The endobronchial injection of oily secretions of gomenol and guaiacol have proved effective.

4. *Bronchial stenosis.* Lipiodol injection may be diagnostic. The narrowing from foreign body stenosis rarely requires dilatation after removal of the object, but tuberculous or luetic stenosis may necessitate repeated dilatation.

5. *Bronchiectasis.* Bronchoscopic treatment here is aimed at removal of the obstruction to cause the ectasia or its associated infection to subside. Bronchoscopic aspiration emphasizes the value of bronchoscopy in elimi-

nating Jackson's "septic tank." According to Jackson, the chronic inflammation of the bronchi in cases of bronchiectasis results in the production of thick pus which is so viscid that it cannot be expelled by the impaired expulsion mechanisms. The method of nature is to eliminate these highly viscid secretions by changing the pus to a more fluid consistency through bacterial decomposition. However, the latter also produces destructive changes in the bronchial walls and destroys ciliary action, thus perpetuating the disease. The stagnation and change in viscosity of the pus in the tracheobronchial tree constitutes what Jackson calls the "bronchiectatic septic tank." By aspirating off the freshly generated, highly viscid pus without waiting for nature to produce a septic tank through rotting of the secretions, the bronchoscope may be used to prevent bronchiectasis and to cure many cases of bronchiectasis in the early stage. Bronchoscopic suction-irrigation with the aspirating bronchoscope plus a cleansing lavage with hypertonic saline solution, followed by endobronchial medication with aqueous antiseptics will usually produce decided improvement and many clinical cures. In chronic cases with lung fibrosis and bronchial dilatation, the bronchoscopic treatment has a palliative effect. It decreases the secretions, lessens stagnation, and eliminates foul odors. External surgery may be required in some resistant cases.

6. *Bronchial asthma.* In bronchial asthma the bronchoscopic aspiration of the tenacious obstructive secretions effects spectacular results in many instances. In other cases the aspiration plus endobronchial medication may be effective in treating the asthma.

7. *Atelectasis and massive collapse of the lung.* The obstructing secretions in these conditions must be removed from the tracheobronchial tree before air can again enter. Postural drainage and forced cough alone may be effective in reexpanding the lung. If these methods fail, however, bronchoscopic aspiration should be done. Sometimes repeated aspirations are required before reexpansion takes place.

8. *Acute tracheobronchitis.* The bronchoscope may be used to remove obstructing secretions and exudates, and to instill medication to shrink the mucosa.

9. *Sequelae of war gassing.* The chronic inflammatory sequelae of war gassing may be treated successfully with bronchoscopic aspiration and the instillation of gomenol or other oily medicaments.

10. *Tracheobronchial diphtheria.* The bronchoscope has saved many lives through the removal of diphtheritic membrane obstructing the trachea or bronchi.

11. *Tumors of the tracheobronchial tree.* In treating these tumors the use of the bronchoscope is limited to the removal of obstructing tissue. Except for the removal of benign growths, bronchoscopy is of much less value in

eradicating malignancies even though apparent cures have been reported. Most benign tumors, such as polyps, fibromata, benign adenomata, and papillomata can be removed with good results. More extensive cases require external surgery.

Some malignant bronchial tumors have been removed successfully with the bronchoscope by endobronchial coagulation and radium application. Bronchoscopy also aids in determining the location and extent of a malignant tumor which is to be removed by external surgery.

Another use is in the palliative treatment of malignancies, removing the destructive growth from the bronchus, and aspirating the retained pus. This clears the air passages and relieves toxic symptoms, thus giving more comfort to the patient and prolonging his life for a variable period of time.

12. *Implantation of radon seeds.* Intrabronchial neoplasms may be eradicated by the bronchoscopic implanting of radon seeds.

13. *Spirochetosis of the bronchi.* This infection may be treated successfully by bronchoscopic aspiration and by the bronchoscopic instillation of arsenicals such as neoarsphenamine.

14. *Endobronchial medication.* In bronchoscopy there is not yet a specific endobronchial medicament applicable to all infections. The removal of granulation tissue may be accomplished with swabs of 5 per cent silver nitrate solution.

Some of the tracheobronchial antiseptics or medicaments instilled with the aid of the bronchoscope are gomenol, 20 per cent in oil; monochlorphenol in liquid albolene, 0.5 per cent; aqueous solution of mercurophen, 1:5000; hypertonic salt solution; gentian violet, 1:2000; acriflavine, 1:2000; hexylresorcinol solution, 1:2000; merodicein, 1:2000; chloramine T, 1:300.

III. CONTRAINDICATIONS TO BRONCHOSCOPY. According to Jackson (7), there are no contraindications to bronchoscopy if the need for this method is urgent. However, bronchoscopy should not be attempted unless there is definite indication and definite need for it, as shown by roentgen ray studies and a physical examination.

Bronchoscopy is not advisable in such serious organic conditions as aneurysm, hypertension, and advanced heart disease with cardiac decompensation, except for foreign body removal. Acute respiratory infections, such as the common cold, pneumonia, and influenza make bronchoscopy temporarily inadvisable and a postponement should be indicated.

Hemoptysis is said to be a contraindication at times. Usually it is best to bronchoscope a bleeding patient in the interval between hemorrhages.

Active syphilis contraindicates bronchoscopy until the disease is under proper control and treatment. The only exception to this is the necessity for immediately removing a foreign body.

Artificial pneumothorax and phrenicectomy are not contraindications for bronchoscopy, but these conditions tend to make therapeutic bronchoscopy more difficult by impairing the restoration of the lung defenses in cases of suppuration which are not of tuberculous origin.

Bronchoscopy in relation to other fields. Bronchoscopy has developed a wide range of uses in the diagnosis and treatment of disease besides the removal of foreign bodies. The bronchoscope has made it possible for the surgeon specializing in thoracic diseases, the internist, and the pediatrician to work as a team, and it has advanced all these fields through its use. Bronchoscopic pneumonography has also contributed greatly to the internist in the interpretation of physical signs and in making possible accurate diagnosis. For the pediatrician the bronchoscope has made great advances in the diagnosis and treatment of respiratory disease in childhood. In thoracic surgery the uses of the bronchoscope have almost revolutionized the diagnosis and treatment of pulmonary disease.

In the field of research the bronchoscope has facilitated advances in bronchial and pulmonary physiology and pathology, and has been responsible for the development of new advances in the diagnosis and treatment of medical and surgical intrathoracic diseases.

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NEWS FROM THOSE IN THE ARMED FORCES

LIEUT. COL. GEORGE H. YEAGER NAMED COMMANDING OFFICER OF 42ND GENERAL HOSPITAL

Lieut. Col. George H. Yeager, Assistant Professor of Surgery and Chief of Operative and Experimental Surgery, has been named commanding officer of the 42nd General Hospital. He was formerly chief of surgical service and made an enviable record for himself in this position. His pleasant, sympathetic personality makes him exceptionally popular with the members of the unit. It is well known that he is deeply interested in the welfare of all its members, a fact that incites confidence and inspires initiative in his men. This unit is one of four such units, two from the University of Maryland Hospital and two from the Johns Hopkins Hospital, activated in Baltimore and now serving in the South Pacific.

Colonel Yeager, who trained as flight surgeon in the One Hundred and Fourth Maryland National Guard before entering the service, was chief of the surgical clinic at the University Hospital and the School of Medicine.

A native of Cumberland, he received his bachelor of science degree from the University of West Virginia in 1925, and his degree in medicine from the School of Medicine of the University of Maryland in 1929. He served his internship at the University Hospital. He then joined the teaching staff of the school and successively became assistant in surgery, instructor, associate, and then assistant professor.

Colonel Yeager has worked extensively in the field of peripheral vascular

Lieut. Col. George H. Yeager, M.C., A.U.S.

surgery and surgery of the sympathetic nervous system. He is especially interested in these fields of surgery and has written several articles for leading medical journals on these subjects. He is a fellow of the American

College of Surgeons, and a certified member of the American Board of Surgery and the Clinical Investigative Society of the South.

42nd General Hospital,
Somewhere in the South Pacific

The Royal Poncianna trees are now in bloom. They are truly magnificent, with a blue sky surrounding green and their flaming color. They are very large and tend to spread much as our mimosa at home. In full bloom there is a solid mass of red flowers, without even the suggestion of a green leaf showing.

General Hospital No. 42

The Bunya tree is fascinating in outline and would make a wonderful painting. Each bunch really looks like a long stem with a great tuft on the end. It is an evergreen variety of tree and reaches enormous proportions.

This is the so-called winter time. The days are magnificent, warm and balmy. The nights by contrast are unpleasantly cold. Four blankets are needed. I have managed to obtain a small electric heater for my room and it is most valuable in keeping it warm enough to sit up and read and to write letters.

We are trying a few innovations. Once a week we have a general staff conference on interesting cases in the house. Once a month we have a major staff meeting with a guest speaker; every two weeks we have an informal get-together in our recreation room instead of the regular evening meal. To-night we had steamed hard crabs, and prawns (shrimp) as a second course with a wonderful sauce!

The above events help us to keep in touch with things scientific and counteract the trend toward isolation and war problems alone. The social gatherings serve simply as diversion and a break in the routine.

There is a USO show, an excellent one, going on outside of my office. I hope that they send us more of this sort. The whole unit seemed to appreciate it.

Last night we had a unit anniversary dinner dance commemorating our sailing on foreign duty. It was a nice jolly affair without being sentimental. We were all sorry that Colonel Pincoffs was still on his trip and could not be present.

* * * * * * * *

The nurses gave me a very lovely silver mug for Christmas in honor of my promotion and on it is engraved: "Lt. Col. George H. Yeager: Nurses, 42nd General Hospital, Australia, 1942."

The first Noel is being broadcast on the radio. The hospital looks most festive. The nurses have decorated it in a very beautiful manner with a gala holiday air. There is a small evergreen tree in each ward. Carols are to be sung at 5:30 a.m. Later in the day individual presents are to be given to the patients. They really seem to like it here and we are glad. Mental inspiration is certainly essential to their recovery.

At the beach we have met quite a few attractive and interesting people belonging to the so-called "station" class. A station over here means a tremendous plantation or ranch of thousands of acres of ground and usually where either sheep or cattle are raised. In the analysis it is a ranch with much of the tradition of our southern plantations and apparently with much of their charm. The people are well bred, conservative, cultured individuals completely lacking in the snobbery that we sometimes associate with the wealthy English families. They ride well, without being conscious of the fact and without becoming horsey. The women are having a particularly hard time and are having to do the work of pioneers. They are not permitted to employ anyone unless he is lame or practically blind. As a result, they have had to start herding cattle, being doctor, and in fact fulfilling the thousand and one duties that we associate with our own early plantation families.

Sincerely,
George H. Yeager

LIEUT. COL. MURRAY M. COPELAND NAMED HEAD OF 142ND GENERAL HOSPITAL

Lieut. Col. Murray M. Copeland, Instructor in Surgery, has been assigned to command the 142nd General Hospital organized at the University of Maryland and now stationed at an American base in the South Pacific.

LIEUT. COL. MURRAY M. COPELAND M.C., A.U.S.

Before entering the Army in 1942 Colonel Copeland was director of the tumor clinic at Baltimore City Hospitals, pathologic consultant at the

Hospital for the Women of Maryland, and visiting surgeon at Union Memorial Hospital, the Church Home and Infirmary, Hospital for the Women of Maryland, Franklin Square Hospital, and Baltimore City Hospitals.

After graduation from Oglethorpe University in 1923, Colonel Copeland was graduated from the Johns Hopkins School of Medicine with a degree of doctor of medicine in 1927. He then served at Baltimore City Hospitals under the late Dr. Thomas R. Boggs, also engaging in cancer research at Hopkins under the late Dr. Joseph C. Bloodgood. Later he was appointed a surgical fellow at the Mayo Clinic, and subsequently a clinical and research fellow in cancer at Memorial Hospital, New York. For four years he was resident physician at Union Memorial Hospital, studying under the late Dr. J. M. T. Finney.

Colonel Copeland entered the Army as a major and left for his overseas station in May, 1942. The following November he was appointed executive officer to a service command surgeon, and in February of this year was promoted to his present grade.

He is internationally known for his articles on cancer, having collaborated in the writing of a book, "Diseases of the Breast," and is co-author of a book on bone tumors entitled "Tumors of Bone." In addition he has written numerous other articles on cancer and allied subjects for various medical journals. He is a member of the American College of Surgeons and a licentiate of the American Board of Surgery.

The War Department has recently disclosed that University of Maryland and Johns Hopkins Hospital Units are established within walking distance of each other in one of the islands of the Fiji group. The announcement followed a recent visit there by Robert P. Patterson, Under Secretary of War, and Lieut. Gen. William S. Knudsen, director of production. Previously the location of the units was given only as somewhere in the Pacific.

It was revealed that many of the wounded brought to these hospital units are sailors flown in by plane from all parts of the Pacific where United States forces are fighting. A large number of wounded and sick soldiers from the Solomon Islands area have also been brought there.

The units are well equipped to give general hospital service to the wounded and sick, and clinical research has been carried on by the staffs. Numerous cases of burns have been treated and the results of treatment by various agents studied. Malarial and tropical fevers and their treatment are being closely observed, also the effect of various new drugs on infection.

Lieut. Col. Murray M. Copeland is in charge of the University of Maryland Unit and Col. George G. Finney commands the Hopkins group.

Col. William H. Triplett, Baltimore medical officer and one of our prominent alumni who served with Maryland troops in England until illness forced him to return to the United States, has been made Commandant of the Army Specialized Training Unit at the Medical and Dental Schools of the University of Louisville.

Colonel Triplett, who has reported to Louisville to take over the duties relinquished by Col. Marshall J. Noyes, was discharged from Walter Reed Hospital on August 5 after having been treated there since his return from England in April.

After having served overseas as a first lieutenant in World War I he became one of the original members of the One Hundred and Fourth Medical Regiment in 1920 and was made lieutenant colonel and executive officer in 1940. In February, 1941 he was placed in temporary command of the Regiment. Before embarkation for England he was promoted to the rank of colonel but withdrew from that command to become division surgeon of a division containing many Maryland troops.

Lieut. Col. Walter D. Wise, Professor of Surgery, has been named consulting surgeon for the Third Corps Command.

Capt. Milton J. Layden, Class of 1938, has been awarded the Soldier's Medal for valor. The medal was presented to Captain Layden, a flight surgeon in the Army Air Force, on June 26, 1943 by the command of Maj. Gen. James Doolittle. The citation accompanying the award read:

> "The Soldier's Medal is being awarded for the outstanding heroism of Captain Layden in the face of imminent danger. He voluntarily rendered heroic assistance at the scene of an appalling disaster occasioned by a terrific explosion of bombs.
>
> "Trucks loaded with bombs were burning furiously, but despite the danger of imminent explosion Captain Layden labored to give all possible aid and assistance to the injured. Charred and maimed bodies were treated unmindful of the warning given him that further explosions would occur.
>
> "He was forced to withdraw by order of superior authority. The heroism, valor and courage in the face of great danger reflect great credit upon Captain Layden and the Armed Forces of the United States."

Captain Layden enlisted in the Army in October, 1940 and received his wings early in 1942 upon completion of a course at the School of Aviation Medicine at Randolph Field, Texas.

The promotion of Capt. Webster Mills Strayer from the grade of first lieutenant is announced in orders issued by the Caribbean Defense Command. Captain Strayer is physician and assistant surgeon of the headquarters squadron of an air depot group of the Sixth Air Force Service Command.

In June, 1941 Captain Strayer received his degree in medicine from the School of Medicine of the University of Maryland. He was commissioned a first lieutenant in July, 1942 and the following September attended the Medical Field Service School at Carlisle, Pa. He arrived in the Caribbean area in December, 1942.

Lieut. Harold Henry Aaron, Class of 1933, has been promoted to captaincy. After serving his internship at Lebanon Hospital in New York, Captain Aaron became a specialist in pediatrics. Now a medical company officer, he was commissioned a first lieutenant on November 18, 1942.

ITEMS

ATTENTION ALUMNI!

The School of Medicine of the University of Maryland has been in existence 136 years. The 137th academic session will terminate on December 23, 1943. This is the first time in 136 years that two classes have graduated in the same calendar year.

The Medical Alumni Association wishes to honor the second graduating class in 1943 just as it did the first. Full particulars will reach you by letter about December first. Stand by to honor the graduating class in these unusual times.

Officers of the Medical Alumni Association

DR. ALICE S. WOOLLEY NAMED PRESIDENT-ELECT OF THE NATIONAL AMERICAN MEDICAL WOMEN'S ASSOCIATION

Dr. Alice S. Woolley of Poughkeepsie, New York, Class of 1930, was named President-Elect of the National American Medical Women's Association at the annual meeting of its national board.

Dr. Woolley is past president of the New York State Women's Medical Society, and is now chairman of its committee on opportunities for medical women. She spoke before the Congressional committee on a bill commissioning women physicians in the Armed Forces. During the last war Dr. Woolley was awarded the Medaille de la Reconnaissance Francaise by the French government after two years of war service overseas.

Widely interested in civic affairs, Dr. Woolley is a member of the boards of the Bowne Memorial and Samuel and Nettie Bowne hospitals. She is also on the staff of St. Francis' Hospital and the courtesy staffs of Vassar Hospital and the Northern Dutchess Health Center at Rhinebeck. Dr. Woolley is a director of the Dutchess County Health Association, a member of the council of the Dutchess County Girl Scouts, and on the board of the Dutchess County Chapter of the American Red Cross.

Other affiliations of Dr. Woolley include the Cosmopolitan Club of New

York City, the Women's Overseas League, American Association of University Women, Mahwenawasigh Chapter of the D.A.R., Women's City and County Club, and the Tuesday Club.

Dr. Arthur M. Shipley, Professor of Surgery, was made Vice-President of the American Surgical Association at its spring meeting in Cincinnati. The announcement came as a complete surprise since Dr. Shipley was unable to attend the meeting because of the stress of additional work. Besides his duties at the University Hospital he is chairman of the Advisory Committee for Procurement and Assignment of Medical Officers of the Third Service Command, U. S. A., which comprises Maryland, Pennsylvania, Virginia, and the District of Columbia.

During his long association with the School of Medicine Dr. Shipley has taught many men who have become famous as physicians and surgeons. Among them are Maj. Gen. Norman T. Kirk, now the Surgeon General of the United States Army, and Brig. Gen. Fred Rankin, Surgical Consultant in General Kirk's Washington headquarters.

During the absence on active service of Capt. Carl D. Clarke, Dr. C. Gardner Warner will perform the duties of chairman of the Board of Editors of The Bulletin of the School of Medicine, University of Maryland.

Dr. Otto C. Brantigan, Assistant Professor of Gross Anatomy and Associate in Surgery, has been appointed by Dean R. U. Patterson to serve as the surgical member of the Board of Editors.

Dr. C. H. Hemphill, Class of 1913, has been made chief of the first aid and accident department of the medical division of E. I. duPont de Nemours Co. at Pasco, Washington.

Dr. Herbert C. Blake, B.M.C. 1905, was elected State Commander of the American Legion at the convention held in Baltimore on August 15 and 16. He has been active in war veteran affairs since his return from France after World War I. He is a Past Commander of Maryland Guard Memorial Post No. 35 and of the Veterans of Foreign Wars.

Dr. Blake served as Major, M.C., 104th Combat Engineers, 29th Division, also commanding officer of the 10th Medical Battalion, Maryland State Guard.

MEDICAL LIBRARY NOTES

Sincere gratitude is extended to the donors of the following gifts presented to the Medical Library from October, 1942 to June, 1943:

Dr. Sidney Berman: "The minds and nerves of soldiers," by E. L. Hanes, 1941.

Dr. James N. Brawner: A copy of his book "The mind and its disorders," 1942.

Dr. Clyde A. Clapp: A bound volume of the reprints of his papers published from 1911 to 1943.

Miss E. Georgien Ewing: A collection of student receipts, certificates, photographs, and other items belonging to her uncle, the late Dr. Amas E. Parker, Class of 1872.

Dr. Andrew C. Gillis: "A soldier in science," by B. K. Ashford, 1934; "Edward Jenner" and "Edward L. Trudeau," by G. T. Hallock, 1928 and 1929 respectively.

Dr. Joseph Gordon: Eight reprints.

Hynson, Westcott and Dunning: Several hundred medical journals.

Dr. William Kaufman: A copy of his book "The common form of niacin amide deficiency disease," 1943.

Dr. G. Carroll Lockard: "Green fields and golden apples," by H. W. Jones, 1942.

Estate of Dr. J. A. F. Pfeiffer: Four hundred medical journals.

Dr. J. Ben Robinson: A copy of his book "The foundations of modern dentistry," 1940.

Lieut. George F. Schmitt, Jr.: Twenty-three medical books.

Dr. William Sharpe: Copies of his two books, "Neurosurgery," 1928, and "Diagnosis and treatment of brain injuries," 1920.

Miss Julia E. Wilson: "The value of health to a city," by Max von Pettenkofer, 1873, translated by Dr. H. E. Sigerist, 1941.

The Library is indebted to the editorial office of "Annals of Internal Medicine" for the review copies of books and the exchange journals presented during the year. The contribution of reprints by members of the faculty and alumni also is greatly appreciated.

OBITUARIES

MELCHOR GIST COCKEY, M.D.

Dr. Melchor Gist Cockey, Class of 1879, died on August 1, 1943 at Kansas City, Missouri.

Born in April, 1853, Dr. Cockey received his early education at Loyola College. Shortly after receiving his degree in medicine he entered the medical corps of the United States Army and served in numerous military engagements up to World War I. Despite the fact that he had then passed the age limit he was captain and battalion surgeon in the State Guard.

Dr. Cockey was surgeon general of the national organization of the United Spanish War Veterans at the time of his death. He was also a past department surgeon of the Department of Kansas, Veterans of Foreign Wars, and Past Department Commander of the United Spanish War Veterans. He was a member of the Association of War Surgeons.

FREDERICK W. MITCHELL

Dr. Frederick W. Mitchell, B.M.C. 1898, died on September 5, 1943 at his home in Houlton, Maine.

A native of New Glasgow, N.S., Dr. Mitchell had been an otolaryngologist since 1899. He was a former member of the Maine House and Senate and an executive councillor in 1939 and 1940. In addition he was active in fraternal circles and civic organizations. He was past president of the Maine Eye and Ear Association and the Aroostook Memorial Hospital. Dr. Mitchell was a fellow of the American College of Physicians and Surgeons and a member of the State and Aroostook County Medical Associations.

Blazejewski, Stanley Walter, Wilkes Barre, Pa.; B.M.C., class of 1907; aged 63; died, April 12, 1943, of coronary heart disease.

Bostetter, Howard Johnston, Mt. Savage, Md.; class of 1907; aged 61; died, March 12, 1943, of coronary heart disease, arteriosclerosis, and chronic nephritis.

Bush, John H., Binghamton, N. Y.; class of 1884; aged 83; died, May 29, 1943, after a long illness.

Cassidy, Samuel Hopkins, Keyport N. J.; class of 1911; aged 63; died, March 14, 1943, of chronic nephritis and uremia.

Cooper, Barnett Herman, Glen Lyon, Pa.; P. & S., class of 1911; aged 54; died, August 8, 1942, of chronic myocarditis.

Chunn, William Pawson, Baltimore, Md.; class of 1880; aged 84; died, February 19, 1943.

Currier, Everett B., Phillips, Maine; P. & S., class of 1893; aged 77; died, May 22, 1943, of coronary thrombosis.

Davis, Samuel Griffith, Baltimore, Md.; class of 1893; aged 75; died, April 21, 1943, of heart disease.

Deal, Arter Wayne, Lewistown, Mont.; P. & S., class of 1903; aged 61; died, March 13, 1943, of paralysis agitans.

Eckstein, Harry, Staten Island, N. Y.; class of 1931; aged 37; died, March 21, 1943, of carcinoma of the lung with right cerebral metastases.

Eldred, Frank Coral, Sparrows Point, Md.; class of 1891; aged 75; died, May 24, 1943, of nephritis.

Elliott, Alfred, Middleboro, Mass.; P. & S., class of 1900; aged 71; died, March 1, 1943, of heart disease.

Fry, David Paul, Hedgesville, W. Va.; P. & S., class of 1889; aged 75; died, April 14, 1943, of pneumonia.

Gremer, Charles J., Long Branch, N. J.; B.M.C., class of 1909; aged 57; died, March 23, 1943, of cirrhosis of the liver.

Hagerty, Meade Eugene Edgar, Ferguson, Mo.; B.M.C., class of 1908; served during World War I; aged 58; died, April 26, 1943, of hypertensive heart disease.

Hall, Dudley M., Glens Falls, N. Y.; class of 1886; aged 81; died, May 3, 1943, of myocardial degeneration.

Izlar, Arthur LaSalle, Clermont, Fla.; class of 1889; aged 76; died, March 19, 1943, of coronary thrombosis.

Kellner, Rudolph G., Seattle, Wash.; P. & S., class of 1904; aged 71; died, April 19, 1943.

Kennedy, Thomas Frank, Woonsocket, R. I.; P. & S., class of 1900; aged 68; died, March 10, 1943, of pneumococcic meningitis following otitis media.

Leichner, William, Hartford, Conn.; class of 1910; served during World War I; aged 59; died, August 10, 1943, of coronary thrombosis.

Lloyd, Albertus L., Rapid City, S. D.; B.M.C., class of 1898; aged 76; died, March 27, 1943, of cerebral hemorrhage.

Madden, William Lawrence, Jersey City, N. J.; class of 1916; served during World War I; aged 52; died, May 10, 1943, of coronary thrombosis.

McCann, Charles Lee, Dallas, Texas; P. & S., class of 1887; aged 83; died, April 16, 1943, of arteriosclerotic heart disease and bronchopneumonia.

McCaul, Nicholas Joseph, Brooklyn, N. Y.; B.M.C., class of 1906; served during World War I; aged 63; died, June 19, 1943, of coronary sclerosis.

McGovern, Andrew M., Lawton, Pa.; B.M.C., class of 1903; aged 66; died, June 14, 1943, of heart disease.

McLaughlin, John Eugene, Statesville, N. C., class of 1886; aged 80; died, June 24, 1943, of carcinoma of the foot.

Meyers, John Lee, Shepherdstown, W. Va.; B.M.C., class of 1903; aged 68; died, March 22, 1943, of acute dilation of the heart, chronic nephritis, and hypertension.

Shippee, David Nathaniel, Wanaque, N. J.; B.M.C., class of 1894; aged 69; died, April 6, 1943, of cerebral hemorrhage and diabetes mellitus.

Smith, James Holmes, Jr., New Orleans, La.; class of 1905; aged 60; died, March 27, 1943, of glioma of the brain.

Stanley, Mark P., Northboro, Mass.; B.M.C., class of 1895; aged 69; died, June 10, 1943.

Stevenson, George Edward, Penn Yan, N. Y.; B.M.C., class of 1895; served during World War I; aged 72; died, March 20, 1943, of coronary occlusion.

Studebaker, David Clemington, Slippery Rock, Pa.; class of 1915; served during World War I; aged 65; died, April 12, 1943, of pulmonary embolism.

Sullivan, Eugene Michael, Jersey City, N. J.; class of 1906; aged 64; died, May 2, 1943, of injuries received in a fall.

Thompson, Theodore Fields, Lakewood, N. J.; class of 1918; served during World War I; aged 53; died, May 23, 1943, of thrombosis of the popliteal artery, arteriosclerosis, and coronary sclerosis.

Wheaton, Harry Whitney, Baltimore, Md.; class of 1917; served during World War I; aged 51; died, April 24, 1943, of acute circulatory collapse following spinal anesthesia.

Wright, Allen Henry, Northfield, Mass.; class of 1906; aged 65; died, June 17, 1943, of cardiorenal disease.

Young, Edgar William, Petersburg, Va.; B.M.C., class of 1911; served during World War I and was decorated with the Order of the Purple Heart; aged 55; died, May 22, 1943, of pneumonia.

Zimmerman, Charles Olin, Oakland, Calif; class of 1882; aged 83; died, June 28, 1943.

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HYPERTHYROIDISM AND THIOURACIL*†

A PRELIMINARY REPORT

VIRGINIA PALMER, M.D.
BALTIMORE, MD.

Little is really known concerning the hyperthyroid state. What motivates the thyroid to become abnormal, what consequent effect this abnormality has upon the body as a whole, or why the administration of iodine is frequently effective are all matters of interesting conjecture.

In the past few years certain investigations, mainly along endocrine and metabolic lines, have opened up new avenues of approach. One of the most interesting avenues has come through the discovery of the MacKenzies and McCollum (5) that sulfaguanidine would induce thyroid hyperplasia in rats and the observation by Richter and Clisby (7) of a similar change upon the administration of thiourea derivatives. These rats presented evidence of lowered metabolism but the thyroid histologically showed hypertrophy of the acinar epithelium with infolding of columnar epithelium, hyperemia, and gross enlargement with reduction in the amount of colloid typical of hyperplasia. The effect persisted with iodine added to the diet but was prevented by the administration of thyroxin or thyroid extract or by hypophysectomy. The MacKenzies, working on sulfaguanidine, found that in addition to iodine the thyroid-metabolic effect was not prevented by para-aminobenzoic acid, vitamin C, and liver. They reported, "... the sulfonamides and thioureas probably exert a depressing influence primarily on the functional activity of the thyroid and hence on the basal metabolic rate, and that the thyroid hyperplasia is a reflection of increased pituitary activity resulting from this depression." (4)

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* From the Department of Medicine, School of Medicine, University of Maryland and University Hospital.

† Received for publication November 15, 1943.

Astwood et al. (2), working on the same problem, found that the administration of certain sulfonamides or of thiourea to normal rats resulted in an enlarged hyperemic, hyperplastic gland coincident with a state of hypothyroidism. The thyroid hyperplasia was not influenced by large supplements of iodine but was abolished by the administration of thyroid powder and by hypophysectomy. They concluded that the mechanism of the goitrogenic action of these substances is probably centered within the thyroid gland itself but may be interference with an enzyme system or synthesis of of some hormone precursor. They proposed the following sequence of events: "Shortly after the drug (thiourea) is administered, the organism becomes unable to synthesize thyroid hormone at a normal rate and the quantity of circulating hormone begins to fall. In response to this deficit an excess of thyrotropin is produced by the pituitary which stimulates the thyroid to hyperplasia and to release of normal thyroid hormone stored therein. Within forty-eight hours of first administration of the drug these compensatory changes are histologically visible, and for a number of days this mechanism is adequate to maintain the metabolic rate at a normal level. Eventually, however, the store of normal thyroid hormone is exhausted, as evidenced by a complete loss of demonstrable colloid at the end of seven to ten days, and as new hormone can only be made at a reduced rate, the metabolic rate falls even though the thyroid hyperplasia is still advancing." (2)

The mechanism of action certainly suggests an inhibition of thyroxin formation, for after a few weeks of treatment with thiouracil the protein-bound iodine of the plasma reaches low normal or subnormal levels. It is conceivable that the drug combines with some iodine deficient fraction and renders it inactive by interfering with an enzymatic or catalytic process so that the thyroid, provoked to excess activity only to have its output in turn neutralized, ultimately becomes exhausted.

Williams and Bissell (8) found that the drug did not inhibit the stimulating effect of thyroxin on the basal metabolic rate when given to myxedematous patients, nor did it inhibit the effect of thyrotropic hormone. This was proved by giving antuitrin T along with thiouracil and finding that within three days the thyroid gland had responded to the stimulating effect of the thyrotropin by becoming larger and firmer, but the basal metabolic rate declined.

Astwood reported three cases of hyperthyroidism treated with thiouracil, and Williams and Bissell reported nine. The latter have found the drug to be absorbed rapidly and excreted quickly. One subject who received 0.2 gm. was found to have a blood level of 2.3 mg. per cent at the end of fifteen minutes but still showed a trace on the third day. In a study of an improved method of blood determinations and urinanalysis, Williams, Kay, and Jandorf (10) found that the drug is excreted rapidly and that the initial doses should be given at frequent intervals. It is reported that almost all the drug in the blood exists in the cells, its concentration in the white cells being many times that in the red cells. The distribution of thiouracil in the tissues was determined in three patients who were dying from nonthyroid conditions and it was found that most of the tissues, including the thyroid, contained 1 to 3 mg. per cent of the drug, but that concentrations were greater in the adrenal glands, bone marrow, and pituitary gland.* The excretion of thiouracil is found in the urine; none has been recovered in any stool specimens.

A series of these cases is now under treatment at the University Hospital and, although none has been observed for more than four months, a preliminary report on them is being made.

EXPERIMENTAL RESULTS

In this group of patients treated with thiouracil various dosage schedules were used. The usual method was to give 1 gm. of thiouracil† daily for three days (one 0.2 gm. tablet every four hours, omitting the 4 a.m. dose), 0.8 gm. for three days, 0.6 gm. for three days, then gradually to reduce the amount until a daily maintenance dose of 0.1 gm. or less was reached.

An effort was made to get at least two basal metabolic determinations on each patient before starting him on thiouracil, the second being determined after sedation, the administration of vitamins, and bed rest routine have been started. Two of the cases reported were carried on thiouracil alone, this being done because of clinical curiosity in evaluating the drug. The adjunctive therapy of sedation and thiamin chloride or the whole vitamin B complex is considered most important. It is probable that vitamin C is even more important but the administration of added amounts of this substance to the diet was omitted because there were already a sufficient number of unknown variables to consider.

Frazier and Ravdin (3) have found that when vitamin B complex was given there was a greater reduction in the pulse rate, more rapid weight gain, and a shorter preoperative period. Hyperactivity of the thyroid stimulates the nervous system and cell oxidation. Williams et al. (9) followed the levels of thiamin and diphosphothiamin, the biologically active form of thiamin, in the blood of forty unselected thyrotoxic patients and found these to be below normal and the pyruvic acid to be elevated. However, the thiamin effect may not be important in lowering the basal metabolic rate without more specific medication. One of the patients soon to be started on treatment with thiouracil had a basal metabolic rate of +65 per cent and then +47 per cent; after ten days of phenobarbital sedation and massive doses of vitamins orally and parenterally the rate was +67 per cent. In another instance the basal metabolic rate was +116 per cent; after a week of nonspecific adjunctive treatment it was +92 per cent and later rose to +96 per cent.

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* These findings are open to question because the determinations were made at autopsy on patients who had received large doses of thiouracil shortly before death. Circulatory defects, venous stasis, and similar conditions cannot be evaluated definitely.

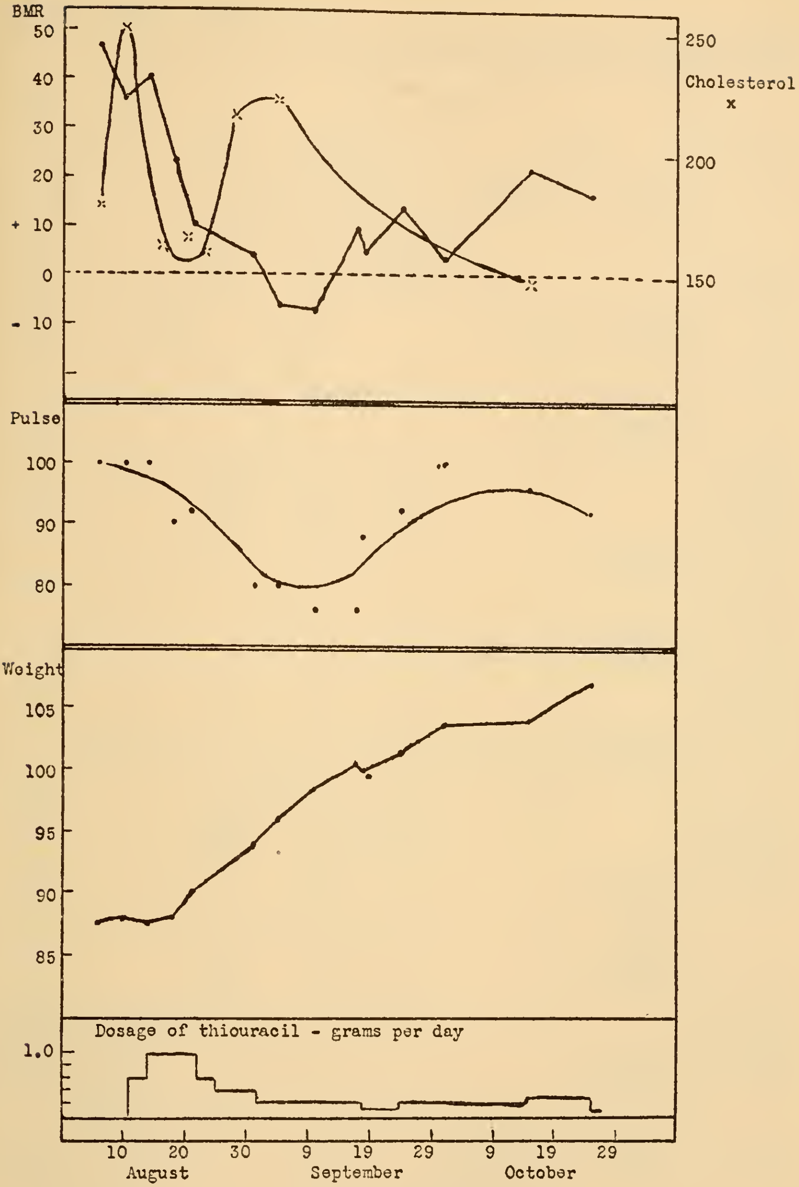
† The thiouracil was supplied by the Lederle Laboratories, Inc., Pearl River, New York.

All the patients in the series reported here had complete blood counts at least four times a week and urinalyses approximately every other day. Blood chemical examinations were made at frequent intervals and were relatively unchanged. In two of the patients who developed edema the serum chloride level and carbon dioxide combining power were determined, because Williams and Bissell had found an alteration of these in one of their cases in which a similar phenomenon was observed. Glucose tolerance tests were made on many of the patients, but no report is presented here because the curves were determined merely in support of a clinical impression of hyperthyroidism. In only two cases out of seven was the curve typical of hyperthyroidism, but all the patients were obviously thyrotoxic. Cholesterol determinations were made but do not seem to be of value in following the level of hyperthyroidism.

CASE REPORTS

Case No. 1: M. M., a 49 year old negro woman, was admitted on August 3, 1943 with the complaint of a "dead sick feeling above the navel" and loss of weight, approximately 26 pounds, during the preceding five months. She also complained of generalized weakness, nervousness, and excitability, which had been becoming worse for the past five to eight years. In March, 1940 she was found to have a basal metabolic rate of +16 per cent and a diagnosis was made of colloid goiter. Upon admission the blood pressure was 180 mm. of mercury systolic and 70 mm. diastolic, with a pulse rate of 116. The patient was small, emaciated, alert, and restless. Her skin was warm and moist. There was a fine tremor of the eyelids, but no distinctive eye signs. The tonsils were large and follicular. The trachea was deviated to the left by a diffusely enlarged thyroid, with considerable enlargement of the right lobe. The heart presented a visible apical impulse and thrust in the sixth intercostal space 8 cm. from the midsternum. Blowing systolic murmurs were heard at mitral and aortic areas. There was mild pitting edema of the ankles and a fine tremor of the extended fingers. The basal metabolic rate was +47 and +36 per cent. A diagnosis of nodular and diffuse thyroid enlargement with thyrotoxicosis was made.

The following day the administration of thiouracil was started. A 0.2 gm. dose was given at 8 a.m., 4 p.m., and 8 p.m. for three days, and then 1.0 gm. per day for eight days. After the first three days the basal metabolic rate was +40 per cent and the patient showed no ill effects, except for a bitter taste in the mouth. She began to show subjective and objective improvement on the fifth day. No transient enlargement of the thyroid gland was noted. The patient was kept under observation for six weeks, and since no change in the urine or blood was found she was discharged on a maintenance dose of 0.2 gm. of thiouracil every other day. Before discharge the dose had been 0.4 gm. a day, and the basal metabolic determinations had given values of −6, −7, +9, and +15 per cent. She returned to the clinic on September 24 and was found to have a basal metabolic rate



CASE 1. M. M.

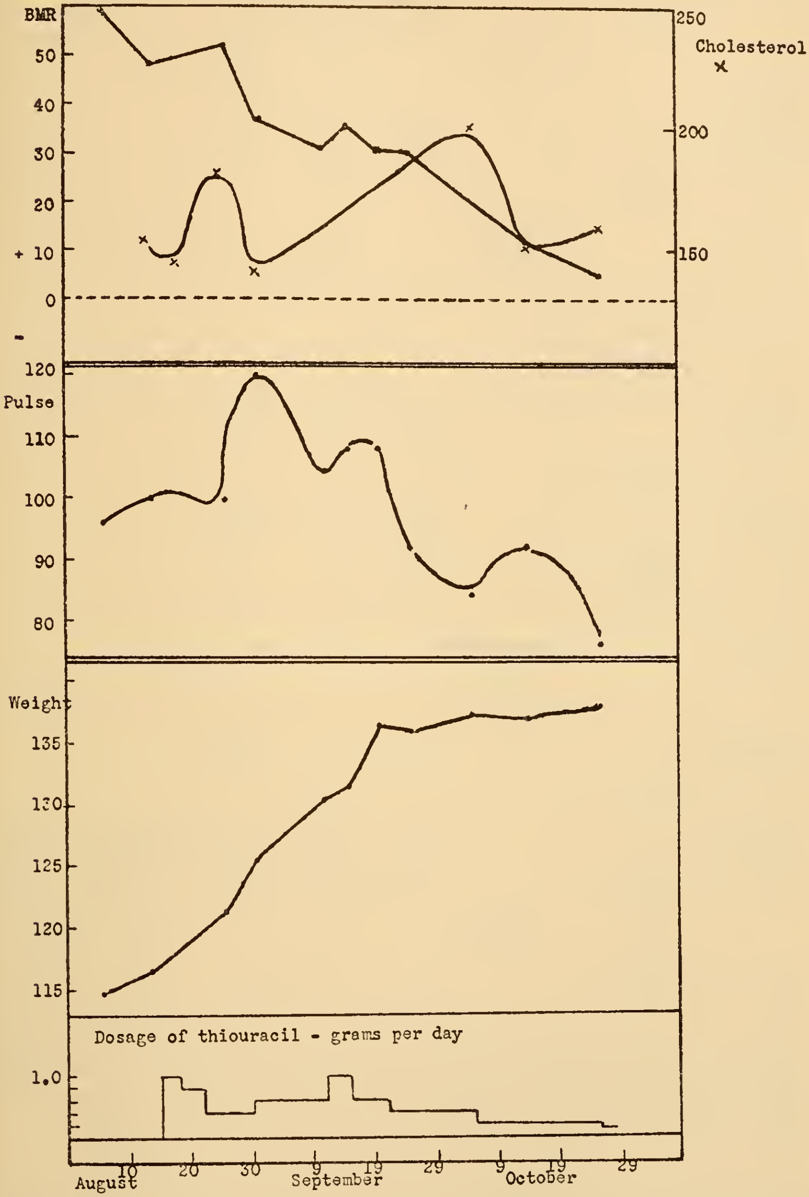
of +14 per cent; a daily dose of 0.2 gm. was begun. The following basal metabolic rate was +3 per cent, so the patient was kept on a daily maintenance dose of 0.2 gm. It is probable that the latest results were not accurately basal because the patient was having some trouble with an infected tooth and mild tonsillitis.

This case has been uncomplicated by any nonspecific medication. The favorable results were obtained with thiouracil alone. The patient has had a progressive weight gain since the eighth day of treatment. Ankle edema cleared up when bed rest was started and has not returned. There has been a decrease in the size of the thyroid in the past two weeks.

Case 1. M. M.

DATE	MEDICATION		PULSE AVERAGE	BASAL METABOLIC RATE	CHOLESTEROL	WEIGHT	REMARKS
	Specific	Nonspecific					
				%	mg.%	lbs.	
8/ 6/43			100	+47	178	87½	
8/10/43			100	+36		88	
8/11/43	Thiouracil 0.6 gm.						Nausea
8/13/43					250		
8/14/43	Thiouracil 1.0 gm.		100	+40		87½	
8/16/43					162		
8/18/43			90	+23		88	
8/20/43					166		
8/21/43			92	+10		90	
8/22/43	Thiouracil 0.6 gm.						
8/23/43					160		
8/25/43	Thiouracil 0.4 gm.						
8/28/43					215		
8/31/43			80	+4		94	
9/ 1/43	Thiouracil 0.2 gm.						
9/ 4/43			80	−6	222	96	
9/10/43			76	−7	185	98½	
9/17/43			76	+9		100½	
9/18/43	Thiouracil 0.2 gm. q.2d.		88	+5		100	
9/24/43	Thiouracil 0.2 gm.		92	+14		101½	
10/ 1/43			100	+3		103¾	
10/12/43							Abscessed tooth was first noted. Patient is still under treatment
10/15/43	Thiouracil 0.3 gm.		96	+22	148	104	
10/25/43	Thiouracil 0.1 gm.	Thiamin chloride 15 mg. q.d.	92	+17		107	In addition to infected tooth, patient now has sore throat and pain in left shoulder

Case No. 2: C. A., a 24 year old woman, was admitted on August 10, 1943 with the complaint of a lump in the neck, difficulty in breathing, nervousness, irritability, and pro-



CASE 2. C. A.

Case 2. C. A.

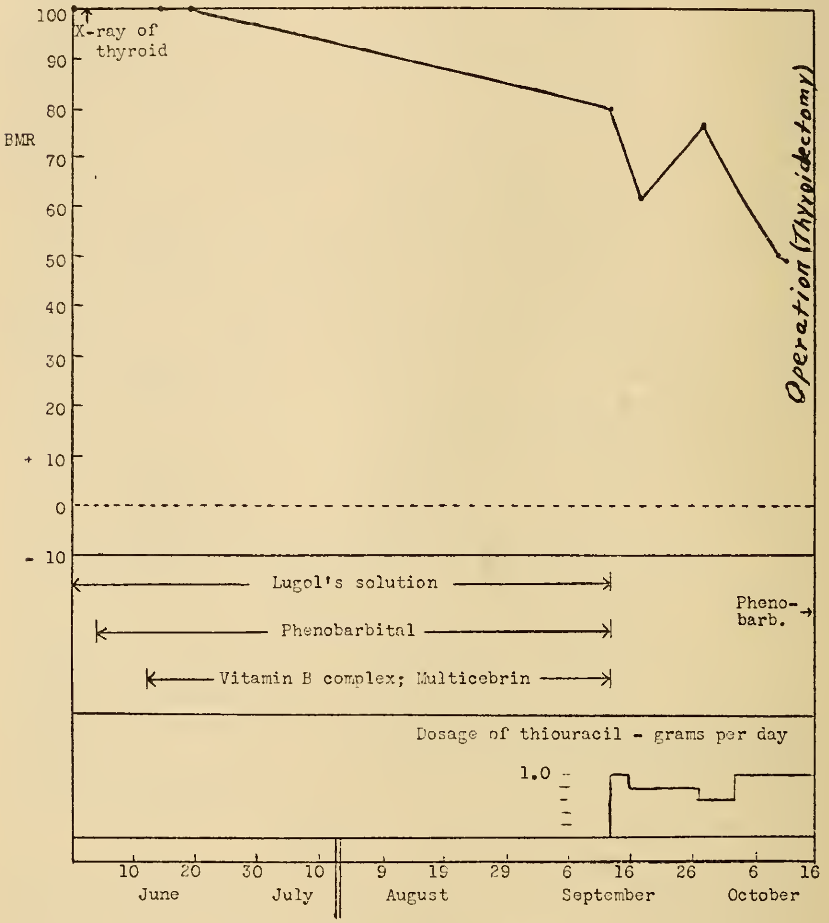
DATE	MEDICATION		PULSE AVERAGE	BASAL METABOLIC RATE	CHOLESTEROL	WEIGHT	REMARKS
	Specific	Nonspecific					
				%	mg. %	lbs.	
8/ 6/43			96	+59		114¾	
8/13/43					154		
8/14/43			100	+48		116½	
8/15/43	Thiouracil 1.0 gm.						
8/17/43		Phenobarbital ½ gr. t.i.d.					
8/18/43	Thiouracil 0.8 gm.				145		
8/22/43	Thiouracil 0.6 gm.						
8/25/43					182		
8/26/43			100	+52		121¼	
8/30/43	Thiouracil 0.4 gm.						
8/31/43			120	+37	142	125½	
9/11/43	Thiouracil 0.6 gm.		104	+31		130½	
9/15/43	Thiouracil 1.0 gm.		108	+36		131½	
9/16/43		Phenobarbital ½ gr. t.i.d. + 8 p.m.					
9/20/43			108	+31		136½	
9/21/43	Thiouracil 0.6 gm.						
9/25/43			92	+30		136	Edema of the ankles, feet, hands, and fingers. Grew steadily worse until 10/4/43, when it began to diminish somewhat. In an effort to find the cause of the edema a few blood chemical examinations were made on 10/5/43, with the following results: albumin-globulin ratio 5.27/1.44; icteric index 7.2; hemoglobin 100%; white blood cells 8700; polymorphonuclears 69%; lymphocytes 19%; monocytes 8%; eosinophils 4%; sedimentation rate 14; hematocrit 44; urinalysis negative.
10/ 5/43	Thiouracil 0.4 gm.		84	+20	201	137¼	
10/14/43	Thiouracil 0.2 gm.	Thiamin chloride	92	+12	153	137	
10/26/43	Thiouracil 0.1 gm.		76	+5	159	138	

gressive weight loss developing in the puerperium of her first pregnancy, fourteen months ago. The lump in the neck was noticed two months ago. A physical examination revealed a restless young woman with warm moist skin, a fine tremor of the extended fingers, and eyes rather prominent with a tendency to stare. The thyroid was definitely enlarged, with a loud bruit easily audible. The basal metabolic rate was +59 and +48 per cent and the administration of thiouracil and phenobarbital was begun. The result of the next determination was +52 per cent and may have been incorrect because the patient had developed a slight infection of the upper part of the respiratory tract. The third basal metabolic rate was +37 per cent. The patient reported that she felt much more relaxed on the fourth day of treatment. A weight gain began coincident with treatment and bed rest and has been progressive. Contrary to expectation, the basal metabolic rate fluctuated in the +30 per cent range for an unduly long period, in spite of an increase in the dose of thiouracil to 1.0 gm. daily. It was found that the diet had been calculated with 150 gm. of protein, and the specific dynamic action of this excess protein was considered a contributing factor. The rate dropped 5 per cent shortly after the diet was changed.

The patient began to worry about being away from home and it was thought that this also might account for the continued elevated rate. She gave no appearance of thyrotoxicosis, the only evidence of any abnormality being the high basal metabolic rate. She was discharged from the hospital and sent home with instructions to report at weekly intervals. On the twenty-eighth day of treatment with thiouracil, a painless swelling of the fingers, wrists, feet, and ankles was noticed. The patient was kept on a dose of 0.6 gm. of thiouracil a day after the nonprotein nitrogen level, albumin-globulin ratio, blood count, and urinalysis were found to be normal. She returned in one week, scarcely able to walk because of the extensive edema of the feet and ankles; the basal metabolic rate was +20 per cent. (Williams (8) reported transient edema in one of his cases which cleared up without discontinuance of the drug. He found an alteration in the serum chloride level and a lowering of the carbon dioxide combining power.) In her second week of extensive edema she was found to have a serum chloride level of 310 mg. % and carbon dioxide combining power of 50 volumes %. The dose of thiouracil was reduced to 0.4 gm. Nine days later the patient was still moderately edematous, with a basal metabolic rate of +12 per cent. The dosage was reduced to 0.2 gm. daily, with 5 mg. of thiamin chloride three times a day. She returned on October 25 for a recheck and was found to have a basal metabolic rate of +5 per cent, a serum chloride level of 370 mg. %, and a carbon dioxide combining power of 65 volumes %. There was no edema; the urinalysis was negative, except for 4 to 9 red blood cells; the results of blood counts and blood chemical examinations were normal. The microscopic hematuria was closely followed because a possible renal complication might be involved, although no such case has so far been reported. Subsequent urinalyses proved negative. The patient has received no thiouracil for the past week and the basal metabolic rate has remained at +8 per cent. Although no change in the size of the thyroid was noted for two and a half months after the beginning of treatment with thiouracil, the gland is now of normal size.

Case No. 3: M. McN., a 52 year old woman, had a history of thyrotoxicosis for the past nine years and had taken iodine almost continuously for the past five years. During this time she had periods of mild cardiac decompensation with moderate but progressive weight loss. Nervousness, fatigue, and restlessness finally compelled her to accept hospitalization. She was admitted on June 2, 1943 with a diffusely enlarged thyroid and a firm asymmetric enlargement of the upper pole of the right lobe about the size of a walnut. The heart was enlarged; rhythm was regular; soft systolic apical and basal blows were heard over the precordium. The pulse rate was 132. The blood pressure reading was 180 mm. of mercury systolic and 70 mm. diastolic. A fine tremor of the hands and tongue was noted. There was no exophthalmos. The basal metabolic rate was +100 per cent.

The patient was given Lugol's solution and deep roentgen ray therapy, also adjunctive medication of phenobarbital and concentrated vitamins. After two weeks the rate was still +100 per cent. She continued on this regimen at home and returned on September 13, 1943 with no new physical findings except a gallop rhythm. The pulse rate was 120. The blood pressure was 150 mm. of mercury systolic and 80 mm. diastolic. The basal metabolic rate was +80 per cent. The patient was given no medication except thiouracil.



CASE 3. M. McN.

Two weeks after starting thiouracil the rate was +77 per cent; the patient presented no appearance of thyrotoxicosis and reported that she felt better than at any time in the past ten years. She was mildly diabetic, but the blood sugar levels were fairly normal on 15 units of protamin zinc insulin before breakfast; however, there was no weight gain even though the diet was increased. The basal metabolic rate which previously had stayed above 100 per cent decreased precipitiously on thiouracil medication to +60, +50, and +49 per cent. An operation was deemed advisable because of the cardiac involvement

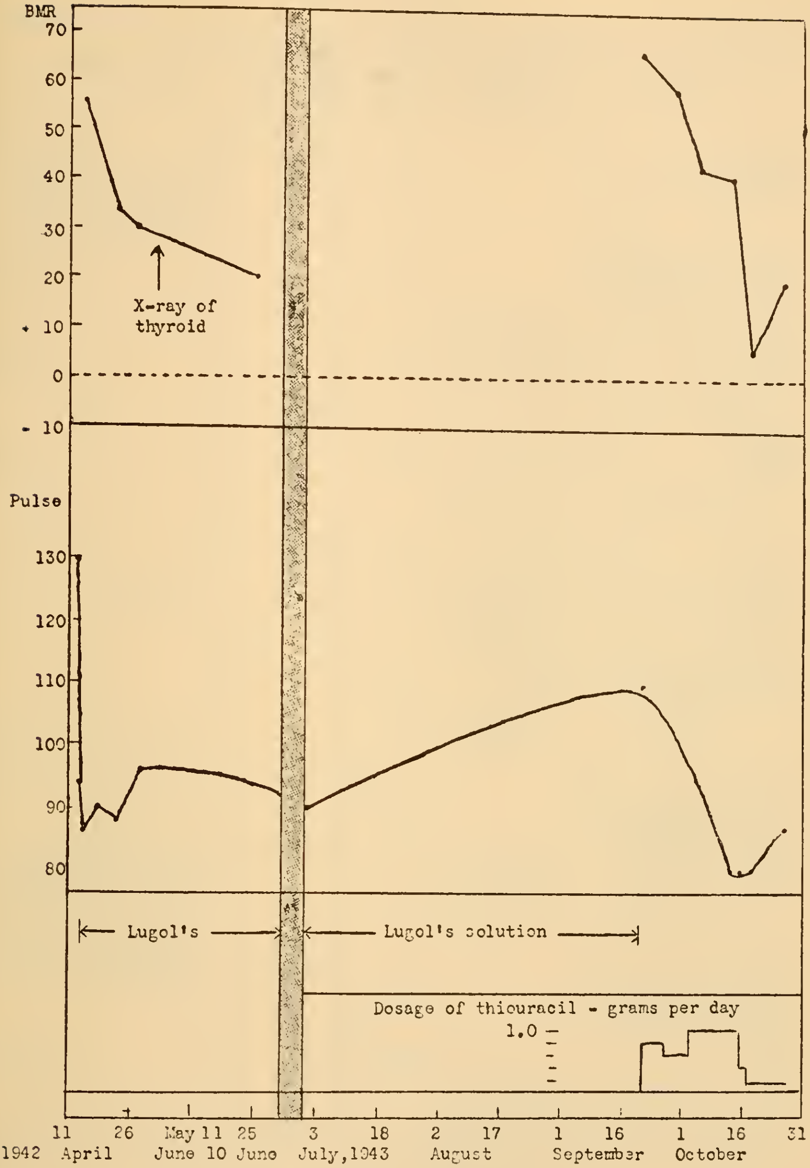
Case 3. M. McN.

DATE	MEDICATION		PULSE AVERAGE	BLOOD PRESSURE	BASAL METABOLIC RATE	CHOLESTEROL	BLOOD CHEMISTRY	
	Specific	Nonspecific					Sugar	Nonprotein nitrogen level
					%	*mg.* %	*mg. per 100 cc.*	*mg.* %
6/ 1/43	Lugol's sol. 5 min. t.i.d.	Digitalis 1½ gr.	130	170/86	+100		214	
6/ 2/43		Deep roentgen ray of thyroid						
6/ 4/43		Phenobarbital ½ gr. t.i.d.						
6/12/43		Vit. B complex Multicebrin	105					
6/13/43		Phenobarbital 1 gr. t.i.d.						
6/14/43			120		+100		200	
6/19/43			120	186/70	+100			
9/13/43	Thiouracil 1.0 gm.	All above discontinued	120	150/80	+80	146		
9/15/43			68–118					
9/16/43	Thiouracil 0.8 gm.	Protamin zinc insulin 15 u.	100				182	20
9/18/43					+62	190		
9/27/43	Thiouracil 0.6 gm.		96					
9/28/43					+77			
9/30/43							143	24
10/ 3/43	Thiouracil 1.0 gm.	Phenobarbital ½ gr. q.i.d.	94					
10/ 5/43					+60	210	154	25
10/ 9/43			86					
10/10/43				140/80	+50		143	25
10/11/43			88		+49			
10/13/43							120	
10/15/43			84				118	25
10/16/43	Avertin and ether were administered at operation. Phenobarbital (hypodermic tablets) 2 gr. q. 6 hr.; morphine sulfate 3 doses of ⅙ gr. Maximum rectal temperature first 48 hr. postoperative 100.6 F. Respirations 32. Took 2000 cc. by mouth first 24 hr. Received 1500 cc. 10% glucose intravenous covered by insulin.							

resulting from the long-standing thyrotoxic state, since it was feared that the firm adenoma in the right lobe might be undergoing malignant metaplasia; also, although the diabetes was becoming milder as the thyroid was being brought under control, the patient yet needed a high carbohydrate diet which had to be supplemented with insulin. She lived in the country and could not be followed at sufficiently frequent intervals. The operation was approached with some trepidation because the basal metabolic rate was still +49 per cent; physiologically, however, the patient appeared perfectly normal, except for a fine tremor of the extended fingers. The operation was done under avertin-ether anesthesia, and a large substernal extension was found. The vessels over the gland were of pencil calibre and pulsating actively. The gland was densely adherent to the capsule and the surrounding tissues, probably as a result of deep roentgen ray therapy. Following operation the maximum pulse rate was 152, and the blood pressure was 128 mm. of mercury systolic and 72 mm. diastolic; the rectal temperature did not exceed 100.6 F. Medication consisted of intravenous injections of glucose covered by insulin, phenobarbital, and 3 doses of $\frac{1}{6}$ gr. of morphine. On the evening of the second day the patient was given a soft diet and appeared to have undergone no more physiologic upheaval than that which might be caused by a tonsillectomy. It is inadvisable to draw inferences from one case, but there is an indication here that thiouracil may in some way correct a disordered system not benefited by iodine. There seemed to be good reason to expect some adverse postoperative reaction, and the possibility of such unfavorable response was considered. It was thought that the administration of iodides might disturb the equilibrium established by thiouracil. If the response of a patient to the drug was retarded by the previous administration of iodine its postoperative use might prove incompatible. No iodides were given and none seemed to be needed. Recovery has been uneventful. The patient was walking about on her fifth postoperative day.

The histopathologic report concerning the gland was as follows: "The acini for the most part were small and all colloid-containing. The epithelium consisted of only one layer and no vacuolization of the colloid material was seen. The gland showed remarkable involution. There were still a few well marked spurs present. The stroma showed much lymphocytic infiltration and a great deal of fibrosis. In several small areas there was some calcium deposition. There were several dilated acini filled with colloid. Also, several small cystic areas were present. Impression: Colloid adenoma."

Case No. 4: B. D., a 36 year old woman, was admitted on April 14, 1942 with all the classical signs of hyperthyroidism, including a moderate exophthalmos. She was found to have a basal metabolic rate of +56 per cent and was started on 5 min. of Lugol's solution three times a day. Although the rate fell to +33 per cent she still was decidedly toxic, therefore deep roentgen rays were applied to the thyroid. She continued to take Lugol's solution and was given sodium bromide. Two months later the basal metabolic rate was +20 per cent and the patient continued to feel well except that she was jittery. During the next year her condition was satisfactory without medication, except for nervousness and irritability. She consulted her physician on July 1, 1943 because of exhaustion, restlessness, and weight loss. The dose of 5 min. of Lugol's solution three times a day was resumed for the next two months, but the patient did not improve as she had in the past. She was admitted on September 21, 1943 with a basal metabolic rate of +67 per cent; after twenty-one days of thiouracil medication the rate had fallen to +6 per cent. On the third day of treatment the patient complained of burning in the region of the thyroid. This burning sensation persisted for six days and gradually disappeared. The gland showed associated enlargement and increased firmness, but it returned to its previous size by the fourteenth day of treatment. A feeling of general well-being and weight gain began during the third week of treatment. This patient is the only one who developed menstrual irregularity while being treated with thiouracil. Her periods had always been regular, but for the past three weeks she has had amenorrhea. The white blood cells, never above



Case 4. B. D.

7000, fell to 4000, with no change in the differential. All medication was discontinued and two days later the white blood cell count became normal. The basal metabolic rate one week later was +20 per cent; the white blood cell count was 7200. The patient is still under treatment.

Case 4. B. D.

DATE	MEDICATION		PULSE AVERAGE	BASAL METABOLIC RATE	CHOLESTEROL	BLOOD CHEMISTRY
	Specific	Nonspecific				
				%	mg. %	
4/14/42			130	+56		Hemoglobin 75%, white blood cells 3775, polymorphonuclears 64%, lymphocytes 36%
4/15/42	Lugol's sol. 5 min. t.i.d.		94			
4/16/42		Phenobarbital ¼ gr. t.i.d.	86			
4/21/42		Phenobarbital discontinued	90			
4/27/42			88	+33		
4/28/42		Sodium bromide 30 gr. stat., 15 gr. q.i.d.	88			
5/ 4/42		Roentgen ray of thyroid	96	+30		
6/15/42		Roentgen ray of thyroid ended	94	+20		
7/ 1/42	Lugol's sol. discontinued	Sodium bromide discontinued	90			
7/ 1/43	Lugol's sol. 5 min. t.i.d.		90			
9/21/43	Thiouracil 0.8 gm.	All previous medication discontinued	110	+67	116	Hemoglobin 80%, white blood cells 6500, polymorphonuclears 63%, lymphocytes 34%, monocytes 2%, eosinophils 1%
9/27/43	Thiouracil 0.6 gm.		74–100			
9/29/43			74–100	+59		
10/ 3/43	Thiouracil 1.0 gm.	Phenobarbital ½ gr. t.i.d. + 8 p.m. Vit. B complex tab. t.i.d.				
10/ 5/43			90	+43		White blood cells 7000, polymorphonuclears 65%, lymphocytes 34%, monocytes 1%

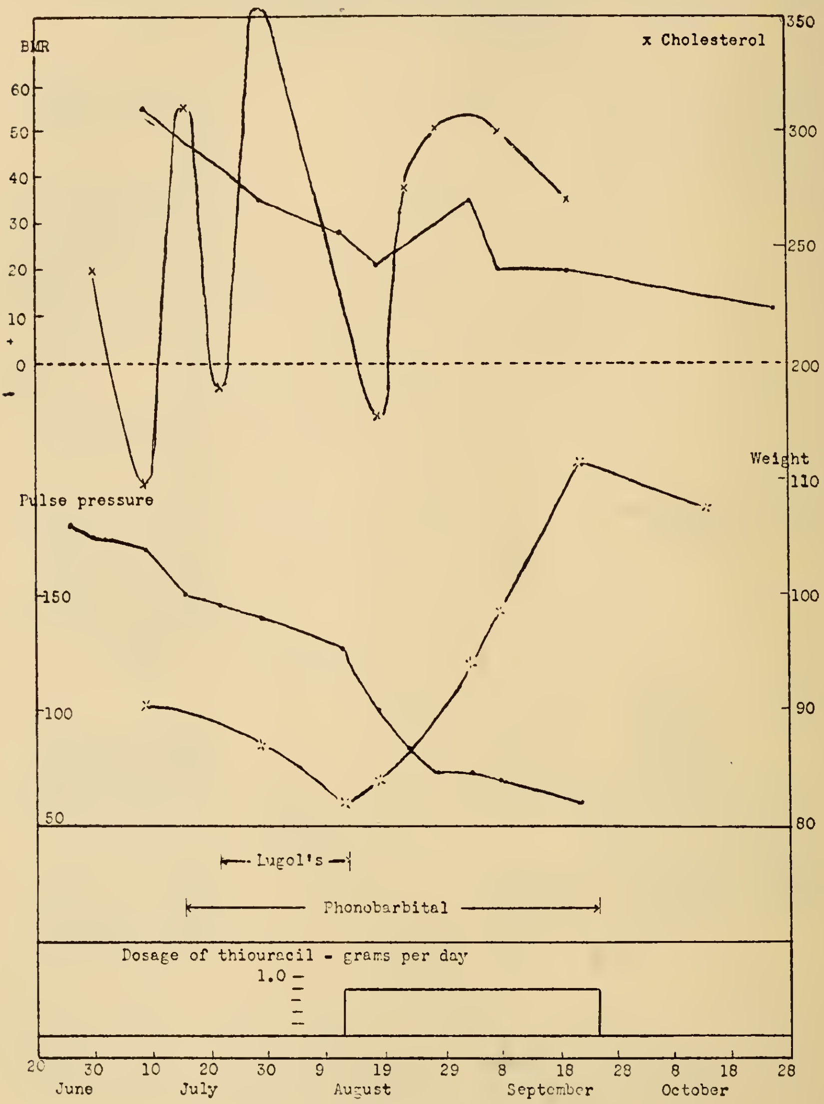
Case 4.—Continued

DATE	MEDICATION		PULSE AVERAGE	BASAL METABOLIC RATE	CHOLESTEROL	BLOOD CHEMISTRY
	Specific	Nonspecific				
				%	mg. %	
10/ 8/43			90			White blood cells 4650, polymorphonuclears 56%, lymphocytes 44%
10/ 9/43			90			White blood cells 5500, polymorphonuclears 69%, lymphocytes 27%, monocytes 4%
10/11/43			88			White blood cells 5000, polymorphonuclears 58%, lymphocytes 42%
10/13/43			80	+42		White blood cells 5200, polymorphonuclears 43%, lymphocytes 57%
10/15/43	Thiouracil 0.4 gm.		80			White blood cells 5700, polymorphonuclears 56%, lymphocytes 42%, monocytes 2%. Menstrual period two weeks overdue.
10/18/43	Thiouracil 0.2 gm.		80	+6		
10/19/43	Thiouracil discontinued	No medication				White blood cells 4000, polymorphonuclears 53%, lymphocytes 40%, monocytes 7%. No change in polymorphonuclears
10/26/43	Thiouracil 0.1 gm.	Medication resumed	87	+20		White blood cells 7200, polymorphonuclears 54%, lymphocytes 44%, monocytes 2%
11/ 1/43			80	+3		

For two months prior to thiouracil medication she had responded poorly to iodine and was in a refractory state on admission. However, in one month she had improved clinically to a level approximately equal to that previously obtained by the use of iodine, sodium bromide, and deep roentgen ray therapy requiring a period of two months.

Case No. 5: D. M., a 15 year old negro girl, was admitted on June 26, 1943 with an acute illness of three days' duration characterized by headache, abdominal pain, diarrhea, and a jerking of the head synchronous with the pulsations in the neck. Her temperature was

104.4 F.; the pulse rate was 134; the blood pressure was 160 mm. of mercury systolic and 0 mm. diastolic. The neck vessels pulsated vigorously enough to shake her entire head;



CASE 5. D. M.

heaving pulsations were also present in the chest and epigastrium. The tonsils were enlarged, hyperemic, and follicular; the posterior cervical glands were enlarged and tender. The thyroid was diffusely enlarged and pulsating, and firm in consistency; the overlying skin was erythematous; a bruit was audible. The heart was full-sized and had a regular

Case 5. D. M.

DATE	MEDICATION		PULSE AVERAGE	PULSE PRESSURE	BASAL METABOLIC RATE	CHOLESTEROL	WEIGHT	REMARKS
	Specific	Nonspecific						
					%	mg. %	lbs.	
6/26/43		Sodium salicylate	115	180				Temperature 104 F. Complains of acute pain in throat
6/30/43				175		241		
7/ 9/43			90	170	+55	149	90½	Attacks of paroxysmal abdominal pain
7/16/43		Phenobarbital ½ gr. q.i.d.		150		310		
7/22/43	Lugol's sol. 15 min. t.i.d.			145		190		
7/29/43			72	140	+35	354	87	
8/12/43	Thiouracil 0.8 gm.		80	126	+28		81¾	
8/18/43			92	100	+21	178	84	
8/23/43			84	84		276		
8/28/43			86	74		303		
9/ 3/43			84	74	+35		94	
9/ 8/43			80	70	+20	301	98½	
9/22/43			98	60	+20	270	111½	
9/25/43	Thiouracil discontinued	Sulfamerazine 1.0 gm. q.i.d.						White blood cells down to 3900. Polymorphonuclears appear toxic. Polymorphonuclears 64%, lymphocytes 31%, monocytes 5%
10/ 6/43	Operation: Grossly infected cryptic tonsils removed along with abundant hyperplastic adenoid tissue. Following operation the temperature spiked around 105.4 F. for four days in spite of sulfamerazine therapy, then returned to normal. Electrocardiographic changes previously suggestive of rheumatic fever disappeared. Thyroid has diminished in size. Signs of thyrotoxicosis have disappeared.							
10/26/43			74		+12		107½	

rhythm; the sounds were loud and slapping, with a mitral systolic blow and a to and fro murmur at the base. The patient improved with the administration of salicylates and the impression at that time was that she had rheumatic fever; this diagnosis was supported by electrocardiographic tracings. The blood pressure remained between 130 and 180 mm. of mercury systolic and 0 mm. diastolic. The basal metabolic rate determined later was found to be +55 per cent; on taking iodine it dropped to +28 per cent. The patient was given thiouracil and the use of iodine was discontinued. On the fourth day she complained of some burning in the throat and stiffness of the gland, but no change in size or consistency was noted. The basal metabolic rate was found transiently elevated between the time the iodine effect had worn off and the thiouracil effect began.

While iodine was being given the patient continued to lose weight, but the pulse pressure was dropping and the rate was slowing. She did not show the general physiologic improvement that later was noted on thiouracil, but her subsequent weight gain on thiouracil may have accounted for this. On September 25 the bone marrow appeared to have been depressed by the drug. It is now known that the daily dose of 0.8 gm. that she had been receiving was too high. The white blood cell count fell to 3900 and the polymorphonuclears appeared toxic. Williams and Bissell have reported a case of agranulocytosis in a patient receiving 2.0 gm. of thiouracil daily. Although in the case reported here the decrease was not sudden and the differential was normal, with polymorphonuclears 64%, lymphocytes 33%, and monocytes 3%, it was not considered advisable to continue the drug. The low white blood cell count lasted for three days and then returned to the usual level of 5000. The patient continued to feel well and gained weight. A tonsillectomy was done and the focus of infection was removed on October 6, 1943. It was then discovered that the patient had been admitted with bilateral retrotonsillar abscesses. The basal metabolic rate on October 26 was +12 per cent, and +27 per cent on November 16; the weight gain in this period was 10 pounds.

The relationship between acute tonsillitis and sudden fulminating diffuse thyrotoxicosis is well exemplified here. Another interesting point is the low white blood cell count encountered on the fortieth day of treatment.

In comparing the values of iodine and thiouracil it was noted that when the latter drug was given the manifestations of toxicity disappeared, although there was an improvement of the patient's condition with the use of iodine. Another interesting feature that might be mentioned is the variability of the cholesterol levels. There seems to be no relationship between the serum cholesterol and the patient's thyroid state.

Case No. 6: G. C., a 46 year old woman, was admitted on August 25, 1943 with congestive heart failure. She had had heart trouble for many years and first noticed ankle edema eighteen years ago. The pulse rate was 160 and totally irregular on admission. The blood pressure was 134 mm. of mercury systolic and 80 mm. diastolic. The patient was well developed and nourished and decidedly orthopneic. She was given digitalis at once and the arrhythmia temporarily broken with the administration of quinidine. After three weeks of treatment compensation was finally established, but the patient was stuporous and lethargic. On September 16, 1943 the basal metabolic rate was found to be +41 per cent. From September 25 to October 7 the patient received 1.0 gm. of thiouracil daily. On the third day of treatment she spontaneously volunteered the statement that she felt much better. She rapidly became more alert and interested in her surroundings. This may have been an improvement coincidental with her improved cardiac state, but the change in her attitude during the first two weeks of treatment with thiouracil was striking when compared with the patient's condition during the previous month. From October 7 to October 9 she received 0.4 gm. of thiouracil daily; at the end of that time the basal metabolic rate was +11 per cent. From October 9 to October 20 she received a daily dose of 0.2 gm. of thiouracil; the rate was then +28 per cent but was determined on the first day of her menstrual period. The patient was kept on the maintenance dose of 0.2 gm. per day. The basal metabolic rate determined on October 27 was +12 per cent. There has been no change in the blood or urine and the patient now feels rather well. However, the pulse pressure has increased or remained at a level between 70 and 100 ever since compensation was established.

Case No. 7: D. S., a 52 year old woman, was admitted on September 19, 1943 because of nervousness, personality change, progressive weight loss, and excessive fatigue since February. The skin was warm and sweaty; the eyes were slightly prominent, with a tendency to stare. The thyroid was moderately enlarged and nodular. Tachycardia was present. The blood pressure was 140 mm. of mercury systolic and 75 mm. diastolic. On September 21, 1943 the basal metabolic rate was +36 per cent and the weight was 162½ pounds. After treatment with 1½ gr. of phenobarbital three times a day the rate was +32 per cent and the weight 160 pounds. On September 25 the following course of treatment was started: 1.0 gm. of thiouracil daily for four days, with ½ gr. of phenobarbital twice a day; 0.6 gm. of thiouracil a day for four days; 0.4 gm. of thiouracil daily for fourteen days; 0.2 gm. of thiouracil a day for ten days. At the end of this time the basal metabolic rate was +3 per cent and the weight 170 pounds. The results of the urine and blood examinations were negative. There was no change in the size or consistency of the thyroid. The patient felt well.

Case No. 8: H. S., a 72 year old woman, was admitted on September 29, 1943 with the complaint of "jumping, thumping heart," fatigue, palpitation, and a weight loss of 46 pounds in the past year in spite of an excellent appetite. The thyroid was of full size and nodular on the right side. The blood pressure was 190 mm. of mercury systolic and 70 mm. diastolic. Auricular fibrillation was present. The eyes were prominent and a stare was noticed. On October 1 the basal metabolic rate was +41 per cent, the pulse rate 108, and the weight 87 pounds. On October 3 the rate was +35 per cent, the pulse rate 118, and the weight 87 pounds. On October 5 the administration of thiouracil was started; the dose was 1.0 gm. a day for three days and was then reduced to 0.4 gm. a day for twelve days. On the sixth day of treatment the basal metabolic rate was +31 per cent, the pulse rate 78, and the weight 86½ pounds; on the fifteenth day of treatment the basal metabolic rate was +25 per cent, the pulse rate 84, and the weight 90 pounds. No unpleasant side effects were noticed. The patient is now receiving a maintenance dose of 0.1 gm. of thiouracil twice a day.

Case No. 9: M. B., a 32 year old woman, was admitted on August 4, 1943 with the complaint of loss of weight, irritability, nervousness, and general weakness bordering on exhaustion. She had a similar condition seven years ago and received medical treatment for hyperthyroidism. Shortly after leaving the hospital she had a return of symptoms. Two years ago she was found to have a basal metabolic rate of +58 per cent, and a subtotal thyroidectomy was done. Following the operation she enjoyed a brief relief from her illness, but shortly thereafter the symptoms returned and have persisted for the past two years. The patient gained 15 pounds after the operation but has lost 18 pounds recently. Bed rest was prescribed for three weeks and Lugol's solution was administered. The basal metabolic rate was then +18 per cent.

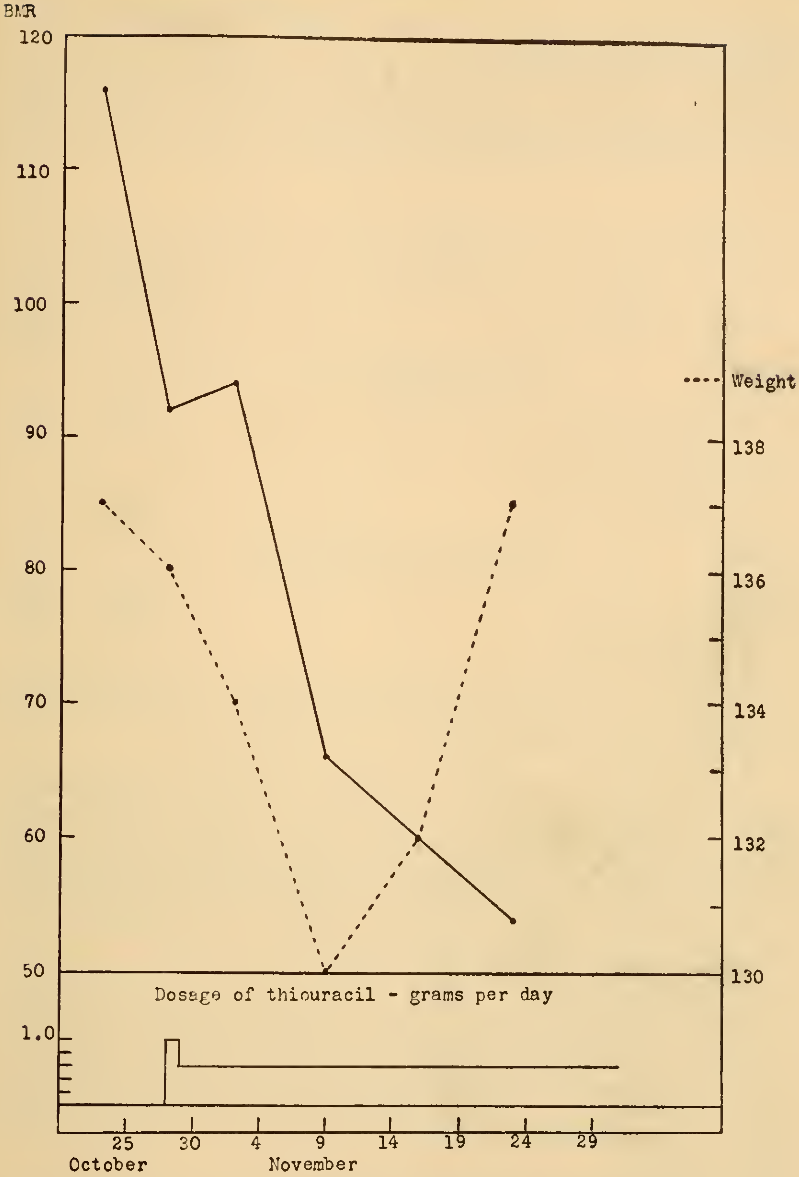
A physical examination showed the classic type of exophthalmic goiter without exophthalmos or swelling. The skin was warm and sweaty. No palpable thyroid tissue remained. The pulse rate was 80; the blood pressure was 130 mm. of mercury systolic and 90 mm. diastolic. The findings of the glucose tolerance test were normal. The following cholesterol values were found: August 5—188 mg. %; August 18—164 mg. %; August 25—180 mg. %; August 31—167 mg. %.

On August 12 the basal metabolic rate was +19 per cent and the weight 108 pounds. The following course of treatment with thiouracil was carried out: 1.0 gm. a day starting on August 15 and continuing for six days; 0.8 gm. daily for four days; 0.6 gm. per day for six days; 0.2 gm. a day for seven days. On August 28 the basal metabolic rate was +3 per cent and the weight 108 pounds. On September 7 the rate was +3 per cent and the weight 110 pounds.

The patient was sufficiently improved to be discharged after receiving 14 gm. of the drug. She is being followed on the outside, and the only medication prescribed is phenobarbital. It is possible that this was not a case of recurrent toxic goiter and that what was treated was a psychoneurosis; however, the treatment was successful and no ill effects were noted.

Case No. 10: P. McK., a 52 year old woman, furnished an interesting example of a rapid response to thiouracil medication. She was first seen in the Outpatient Department in May, 1943 with a diffusely enlarged thyroid and a firm adenoma of the right lobe. The complaints were progressive nervousness, weight loss, and palpitation. The base metabolic rate was +42 per cent. The patient was followed throughout the next six months and given no medication except sedation. The basal metabolic determinations at various intervals gave values of +42, (+74), +45, +47, and +44 per cent. She was admitted to the hospital and given 1.0 gm. of thiouracil daily for four days, at the end of which time the rate was +37 per cent and the patient stated that she felt greatly improved. She was continued on a daily dose of 0.8 gm. of thiouracil for the next five days, and the basal metabolic rate was found to be +7 per cent. She was given 0.4 gm. for the next four days and then started on a maintenance dose of 0.1 gm. daily, when the basal metabolic rate remained at +7 per cent. Phenobarbital also was prescribed. The weight gain began on the ninth day and has been progressive. The physical characteristics of the thyroid have changed curiously in that the diffuse swelling has disappeared entirely, the adenoma has become rather hard and discrete and appears to be directly under the skin. This will be removed for cosmetic reasons.

Case No. 11: L. S., a 52 year old woman, was admitted on October 21, 1943 with the complaint of weakness, nervousness, and a choking feeling because of a lump in the neck. She first noticed fatigue and restlessness eighteen months previously and for the past year was aware of a growing fulness of the thyroid gland. A physical examination revealed an intensely nervous, emotionally unstable woman showing evidence of weight loss, about 50 pounds in the past six months, with a prominent exophthalmic stare and lag of the eyelids. The thyroid was diffusely enlarged to about three times its normal size, with a firm isthmus and a hard walnut-sized nodule in each lower lobe. The basal metabolic rate was found to be +116%, but five days later, after sedation, bed rest, and thiamin chloride therapy, was down to +92%. After five days' treatment with 1.0 gm. of thiouracil a day the patient showed some improvement in that she was less apprehensive and depressed. However, she still displayed the usual manifestations of toxicity; the basal metabolic rate was found to be +94%, and the patient continued to lose weight. She was given 1.0 gr. of desiccated thyroid daily and the thiouracil was reduced to doses of 0.1 gm. six times a day. After two weeks of this medication she presented many changes: her personality was agree-



CASE 11. L. S.

able and cooperative; she was interested in the people about her and was constantly expressing her gratitude over her state of good health and well-being. The exophthalmos was diminishing although the stare remained. The thyroid gland had diminished in size, but the adenomata still were present. The nodule in the right lobe felt more cystic; that on the left was unchanged to palpation.

The patient is still under treatment and is at present taking 0.4 gm. of thiouracil daily with 1/320 gr. of thyrotoxin. The basal metabolic rate has been +66, +60, and +54%. She will be maintained on a daily dose of 0.4 gm. of thirouracil until operation. The gland is to be explored because of the possibility of malignancy.

Case 11. L. S.

DATE	MEDICATION		BASAL METABOLIC RATE	WEIGHT
	Specific	Nonspecific		
			%	*lbs.*
10/23/43		1 gr. phenobarbital q.d., 50 mg. thiamin chloride	+116	137
10/28/43	Thiouracil 1.0 gm.	" "	+92	136
10/29/43	Thiouracil 0.6 gm.	" "		
11/ 2/43		" "	+94	134
11/ 3/43		Desiccated thyroid 1 gr. per day		
11/ 9/43		" "	+66	130
11/16/43		" "	+60	132
11/25/43	Thiouracil 0.4 gm.		+54	139

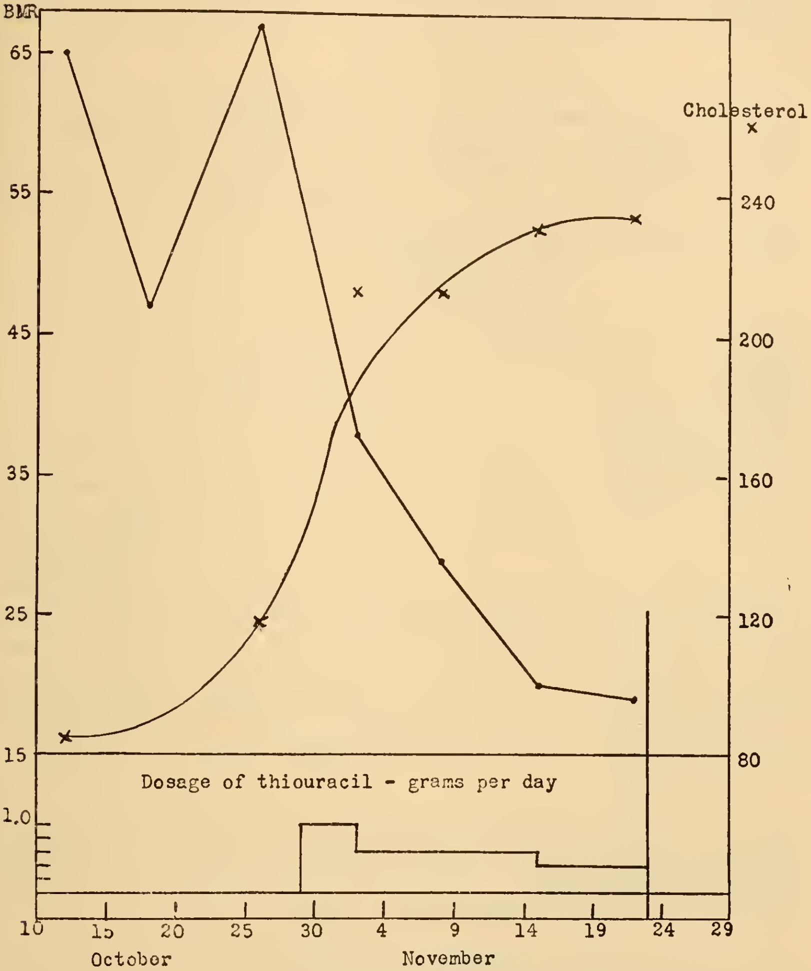
The patient has been ambulatory throughout treatment. The white blood cell count has ranged between 3000 and 7000, with normal differential.

Case No. 12: P. G., a 19 year old girl, was admitted on October 11, 1943 with the complaint of intermittent choking sensations, difficulty in swallowing, nervousness, sweating, and fatigue. Since nine years of age she had had a goiter but did not noticed any change in size until four years ago. In the past year her weight dropped from 242 to 168 pounds. The past history was relevant in that she had had frequent attacks of quinsy and arthralgia and has always had menstrual irregularity. Menarche was at 14 years, followed by varying intervals of amennorhea and oligomenorrhea.

A physical examination revealed an obese young girl with moderate exophthalmos, a stare, slight lag of the eyelids, and difficulty in convergence. Her skin was warm and moist, with a tendency to acne vulgaris. There was marked tremor of the extended fingers. The thyroid was diffusely enlarged to approximately three times normal size and a bruit was audible. The basal metabolic rate was determined on three occasions during the first fourteen days while the patient was given adjunctive therapy and bed rest, but no specific medication. After calculating the rates to be +65, +47, and +67 per cent the thiouracil routine was started.

A transient edema of the feet and hands developed on the second day of specific treatment but subsided on the ninth day without the drug being discontinued. Serum chloride and carbon dioxide combining power determinations were not abnormal. From the eleventh to the fifteenth day of treatment she complained of joint pains chiefly in the ankles, knees, and shoulders. The pains were relieved by taking salicylates and it is probable that they were not related to thiouracil medication.

The thyroid diminished slightly in size but an operation was thought advisable for cosmetic reasons. She had had sufficient goiter to cause disfigurement for the past ten years and even though it was now definitely nontoxic the patient requested surgical intervention.



CASE 12. P. G.

The basal metabolic rate determined the day before operation was found to be +19 per cent. The patient was aware of the arrangements for operation and the usual pre- or postoperative routine used here for thyroidectomy was not followed. A subtotal thyroidectomy was done on the twenty-fifth day after the administration of thiouracil had been begun. Convalescence was entirely uncomplicated; no iodides were given after operation; intravenous glucose was given once in deference to routine.

The pathologic report was as follows:

"*Gross description.* The specimen consisted of two lobes of thyroid, the larger measuring 6 x 4 x 3 cm., the smaller 5 x 4 x 2 cm. Both were smooth and coarsely lobulated externally. On sectioning, each appeared fleshy with scant colloid.

"*Microscopic findings.* This section of thyroid presented characteristics compatible with toxicity. The acinar epithelium was thickened and reduplicated. The colloid was pale and interrupted by toxic vacuoles. The stroma was not abundant and contained few small foci of lymphocytes.

"*Impression.* Hyperplastic thyroid with involutional changes."

Case 12. P. G.

DATE	MEDICATION		WEIGHT	BASAL METABOLIC RATE	CHOLESTEROL	REMARKS
	Specific	Nonspecific				
			lbs.	%	*mg.* %	
10/12/43		Thiamin chloride 50 mg., civitamic acid 50 mg., phenobarbital 2 gr. Bed rest.	168	+65	85	
10/18/43		" "	169	+47		
10/26/43		" "	171½	+67	118	
10/29/43	Thiouracil 1.0 gm.	" "				
11/ 2/43	Thiouracil 0.6 gm.	" "	177	+38	212	Edema of hands and feet for 2 days. Serum chloride 390 mg. %. Carbondioxide 57 volumes %.
11/ 8/43	Thiouracil 0.6 gm.	" "	177½	+29	212	Joint pains, low grade fever for 5 days.
11/15/43	Thiouracil 0.4 gm.	" "	182	+20	230	Patient is now ambulatory.
11/22/43	Thiouracil 0.4 gm.	" "	185	+19	234	

RESULTS OF TREATMENT

1. All cases responded to the administration of thiouracil with a decreased basal metabolic rate. The physiologic improvement was manifested before the rate changed appreciably and usually was noted somewhere between the fourth and seventh days.

2. Transient swelling of the thyroid gland, sometimes associated with a burning sensation, was noted about the fourth to the sixth day in three of the patients. It is probable that the giving of desiccated thyroid during

the first two weeks of treatment is of value in preventing the transient enlargement of the gland caused by excess thyrotropic activity. In one case there was an initial enlargement of the gland on the fourth day of treatment with thiouracil sufficient to cause dysphagia and some respiratory embarrassment. The patient was given 1 gr. of desiccated thyroid U.S.P., and in three days the gland returned to its pretreatment size and became progressively smaller under treatment with thiouracil.*

3. One case of peripheral edema developed. No great elevation of serum chloride was found to account for it, but the carbon dioxide combining power was 50 volumes% on one occasion. The edema, after persisting for three weeks, cleared up shortly after thiamin chloride was administered.†

4. In two cases the white blood cell count became depressed without alteration of the differential. Within three days after the drug was discontinued the white cell count returned to normal.

5. In one case now under investigation microscopic hematuria developed without casts or albuminuria. This may be the beginning of a renal complication. Like some of the sulfonamides, thiouracil is soluble at pH 8.5 but practically insoluble in distilled or tap water. If renal complications were to become frequent, it might be advisable to administer sodium bicarbonate along with thiouracil.

6. Cholesterol determinations do not seem to be of value in following the level of hyperthyroidism.

7. The use of small doses of thiouracil, 0.1 gm., at frequent intervals is a superior method to large doses, but initial saturation is to be desired. In the present series 0.8 gm. is given in 0.1 gm. doses for the first two days, then 0.6 gm. daily; the dose is reduced to 0.4 gm. a day as soon as clinical improvement is established. Experiments are being made with the administration of 1 gr. of desiccated thyroid U.S.P. daily to patients shortly after the fourth day.

8. Previous medication with iodine is said to retard the response to thiouracil, but the delay has not been found to be significant in most instances. However, two patients not reported in this series, because they have been on thiouracil only fifteen days, have so far not made a satisfactory

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* In one case of Williams' series there was thyroid enlargement and progressive oculopathy which developed under treatment, but clinical improvement was rapid and sustained when desiccated thyroid was administered. The beneficial effect of giving thyroid in exophthalmos is well established. (Means, J. H., Hertz, S., and Williams, R. H.: Graves' Disease with Dissociation of Thyrotoxicosis and Ophthalmopathy. Tr. Assn. Am. Phys., **56**: 67, 1941.)

† In a case not reported in this series transient edema started on the second day of treatment and persisted for four days. The carbon dioxide combining power was found to be at the lower limits of normal, 51 volumes %, but the serum chloride level was normal. Sodium and potassium determinations probably would have been of significance.

response. The dosage which has been found adequate in all the other cases has brought about no improvement to date in lowering the basal metabolic rate, reducing the pulse pressure, or slowing the pulse rate. One of these patients has had five weeks' treatment with iodine with moderately unsatisfactory response, and it is possible that there is still an iodine effect inhibiting the response to thiouracil. The other case may have a carcinoma of the thyroid.

9. Adjunctive therapy,—high carbohydrate and low protein diet, vitamins, particularly the B complex, and sedation—is indicated.

DISCUSSION

It is probable that an extrathyroid factor motivates the production of the abnormal state of thyrotoxicosis; possibly in some unknown manner a pituitary-hypothalamic mechanism with autonomic nervous system involvement stimulates the thyroid gland to function abnormally. The sudden onset of the exophthalmic type of illness appearing without previous thyroid disease indicates an extrathyroid motivation. Also, the condition of exophthalmos is not easily produced experimentally by the administration of thyroid hormone, yet it has been produced in thyroidectomized guinea pigs by giving extracts of the anterior lobe of the pituitary gland. The toxic effects do not seem to be attributable to thyroid hormone. The writer was personally interested in a woman who in a desperate attempt at weight reduction took between 30 and 60 gr. of desiccated thyroid U.S.P. daily over a period of six months with no more ill effects than nervousness, tachycardia, frequent episodes of hypoglycemia, and menstrual irregularity (long intervals of amenorrhea), but showed no clinical evidence of thyrotoxicosis.

It has been reported that in the cells of the human exophthalmic goiter there is a hypertrophy of the Golgi apparatus, which is generally accepted as evidence of increased cellular activity. This hypertrophy is found in animal glands that have been given thyrotropic hormone but not in those where desiccated thyroid alone was fed. When such hypertrophy exists, if iodine is given the basal metabolic rate declines and colloid storage takes place, but there is no change in the Golgi apparatus (6). It is probable that iodine acts more directly on the thyroid gland, but thiourea and its derivatives have no effect on the thyroid unless the pituitary gland is present. If the pituitary gland is in some way involved in the extrathyroidal motivation and if thiouracil affects the thyroid by way of the pituitary gland, then this may furnish some light on understanding why the patient seems to improve physiologically on thiouracil, even though the basal metabolic rate and the pulse rate still are elevated.

The response of the patient with Graves' disease to thiouracil administration is no more rapid with regard to the basal metabolic rate and pulse rate than is the response to iodine; possibly it is even slower. Those patients making a rapid response to thiouracil are probably ones who would make a similar rapid response to iodine; yet subjectively and objectively the response is better to the former drug, which seems to promote an improved physiologic equilibrium more completely than does iodine.

The cases described here and others reported in the literature demonstrate an impressive constancy of certain etiologic or precipitating factors in thyrotoxicosis. Given a person in whom the condition of exophthalmic goiter can develop, careful search of the history frequently reveals: 1) emotional shock or stress; 2) a suddenly altered physical or endocrine state, such as pregnancy; 3) focal infection, most especially tonsillitis. In such cases the aberration may be temporary and after a few months' maintenance dosage of thiouracil the patient may return to a completely normal state; whereas, if iodine is used and an operation is not done, the physiologic equilibrium may not be established and the patient may become iodine refractory, as in Case No. 4 of this series.

In cases of toxic adenoma, iodine is only partially effective and thiouracil is definitely indicated either as preoperative medication or in the medical management. A thyroidectomy or an adenectomy should be done for cosmetic reasons if the gland does not diminish in size uniformly or sufficiently.

The modus operandi of the procedure of thyroidectomy, as it has been employed in the treatment of thyrotoxicosis, must be to establish a temporary block of the abnormal thyroid secretion and thus break a vicious cycle. If thiouracil, or a similar agent, can effect the same end, and according to available data that is what does take place, then that treatment is superior.

It must be kept in mind, however, that thiouracil can be a toxic agent, the toxic effects being similar to those encountered with sulfonamide therapy. To date no serious complications have been reported, except that one case of agranulocytosis has been observed. The treatment of more cases over a longer period of time is necessary, but at the present moment thiouracil gives promise of being an important addition to the armamentarium.

The author is indebted to the staff of the biochemistry laboratory and Miss Grace Bauer of the basal metabolism department of the University Hospital, and Louise Kelley, Ph.D., Professor of Organic Chemistry, Goucher College, for their assistance in the preparation of this manuscript.

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AVIATION MEDICINE*

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Military aviation today has become a formidable and essential form of artillery. The military airplane is mounted with one or more cannon and carries either bombs or depth charges whose explosive and destructive forces are equal to, if not greater than, similar forces unleashed by a projectile from a sixteen inch gun, be this gun a land battery or mounted on a railway car, or an integral part of a battleship.

The mission of the medical department of the United States Navy is "To keep as many men at as many guns as many days as possible." The mission of the medical officers of the Army and Navy who are engaged in the practice of aviation medicine is "To keep as many aviators flying in as many airplanes as are available as many days and nights as possible," in other words, "To Keep 'Em Flying."

Prior to what is now somewhat wistfully referred to as World War I aviation was the vocation or avocation of a relatively few daring individuals whose courage and mechanical curiosity exceeded their interest or desire to live to a ripe old age. The embryo aviator was either scolded or tolerated by his parents, pitied by his friends, and adored as a superman by the ladies. During that early period in the history of aviation there was a current saying to the effect that "A man does not have to be crazy to become an aviator, but if he is it certainly helps a lot."

In those antediluvian days there were no special precautions or restrictions, no physical requirements, and few instruments or other devices to protect the aviator, either from his environment or from himself. Because of this the graves of many of those heroes are today scattered hither, thither, and yon over the countryside wherever their frail aircraft bowed to the force of gravity or crashed into an immovable object. However, their lives were not lived in vain for upon the altar of their sacrifices and the ashes of their defeat, often their own ashes, has arisen within a generation a vast superstructure of aeronautics, a tremendous industry, a weapon of offense which staggers the imagination and, it is hoped, a magnificent horizon for the future of civilization on this planet. Psychologically, aviation has provided a new frontier whereby our old men shall see new visions and our young men shall dream new dreams. And these dreams are taking on reality and these visions assuming substance with a speed which in itself is phenomenal.

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As daring and as gallant as these young aviators of the first generation may have been and as heroic as their deeds now appear in the light of our modern safety devices and our working knowledge of the principles of aeronautics and aerography, one must admit that the rôle of superman now belongs to the aeronautic and mechanical engineers of the present and future. Engineering, with its allied sciences has developed and is perfecting airplanes which can fly faster, climb more steeply, turn, bank, and dive with greater force than its human cargo, the pilot, and/or passengers, can withstand. Hence the physical and mental equipment of the aviator and the coordination of his faculties are constantly being challenged by extraneous physical forces beyond his control. His cardiovascular and nervous systems are repeatedly subjected to extreme physical stress and emotional strain, not to mention the exquisite excitement and exhausting tension of battle in the air. How long the human body, the human heart, and mind can stand up under this incessant and increasing pressure from all sides is one of the problems of the flight surgeon.

To cope with the physiologic problems of modern military aviation and to study the effects of extreme stress and strain upon the human body in an effort to comprehend the modus operandi of the cadet pilot under training and the military aviator during combat, there has developed yet another medical specialty or sister science, that of aviation medicine. Its disciples are often called flight surgeons, although a surgeon in the generic sense is usually the man who deals with the aftermath of airplane crashes or wounds received in battle. The term surgeon in relation to aviation medicine is applied to a medical officer who devotes his time to the care of the pilot, to the selection of flying cadets, and to research in the physiologic and psychologic problems peculiar to aviation, hence the designation "flight surgeon."

Aviation medicine is not merely a specialty by-product of the roaring 1940's, nor is it a recent stepchild of internal medicine. It is and has been a continuous study of the forces and factors exerted on the body by flight ever since the Montgolfier brothers in France, in 1783, sent their first passengers into the air in a hydrogen-filled balloon. The passengers thus honored were a chicken, a duck, and a sheep. On October 15, 1783 man made his first actual flight—and lived to tell the tale—when a French nobleman, Pilatre de Rozier, ascended in a huge smoke-filled balloon and returned to the earth intact.

Pioneer work in the physiology of anoxia, or oxygen deficiency, was performed by Paul Bert, a brilliant French physiologist, who published in 1878 the results of his experiments in a vacuum chamber on the effects of decreased barometric pressure on the heart and lungs. All this primary research had been stimulated by the tragic flight in 1875 of Tissandier and his two companions, who ascended to 28,820 feet in an open balloon. The three men lost consciousness as the balloon rose to the region of 26,000 feet; the instruments indicated further ascent, and then a gradual return to earth. On regaining consciousness during the descent, Tissandier found his two companions dead from anoxia.

This epic altitude disaster in the history of aviation was written a quarter of a century before the first flight in a heavier-than-air machine was accomplished by the Wright brothers at Kitty Hawk, North Carolina on December 17, 1903, when they startled the world by four successful hops in their "flying machine." The first trip lasted twelve seconds, the fourth fifty-nine seconds. Thus was germinated the acorn from which a great oak has sprung, spreading its branches over all the earth and thrusting its twigs into the stratosphere.

During World War I, when military aviation was in its infancy, so many crashes occurred that it soon became evident mechanical failure of the airplane alone could not account for all the fatal accidents. Many medical men in both the Army and Navy began to realize that not all aviators or cadets under training who appeared entirely normal both physically and mentally were fit to fly. The fears of this medical group were well founded for a careful investigation of the causes of these crashes revealed that human failure was responsible for 90 per cent of the accidents, 8 per cent were the result of mechanical defects of the airplane or engine, and only 2 per cent met death in combat with the enemy.

The military surgeons of this period first collected the data and then set about to study it systematically in a painstaking effort to eliminate the factor of human failure. Thus the science of aviation medicine in its more modern form began to emerge. That great strides have been made in the past twenty years is attested by the fact that the present day attrition ratio is nearly reversed. In a certain sense aviation medicine has therefore become a branch of preventive medicine, with emphasis on the preservation of personnel.

The flying personnel must be protected against such environmental factors as extreme cold, excessive heat, terrific winds, glare, noise, fire, and vibration. They must be taught to preserve their physical and mental assets to do battle in the stratosphere where the temperature is in the neighborhood of −55 C. At such heights the partial pressure of oygen in the atmosphere falls so low that it cannot enter the pulmonary circulation with sufficient force or rapidity to saturate the hemoglobin of the red blood cells. Thus there will develop an oxygen deficit or anoxia. The higher the altitude the greater the anoxia or tissue asphyxiation, which will cause a progressive narcotization of the brain and spinal cord, a progressive loss of muscle coordination, and finally a lethal depression of the cardiorespiratory centers in the medulla or midbrain.

The effects of oxygen starvation become noticeable between 12,000 to 15,000 feet but can be controlled by the continuous administration of oxygen. As the pilot, provided with an adequate flow of 100 per cent oxygen through his mask, ascends to 35,000 or 40,000 feet above sea level, he will begin to experience anoxia for the second time. This is attributable to the fact that the higher the altitude the lower the barometric pressure. This progressive reduction in the barometric pressure proportionately reduces the partial pressure of rach gas in the rarefied atmosphere. The higher the altitude the lower will be the oxygen tension, until a point is gradually reached where the partial pressure of 100 per cent oxygen becomes so low that this gas cannot enter the blood through the lungs with sufficient force and saturation to sustain life. The insidious effects of anoxia will therefore develop between 40,000 to 45,000 feet in spite of the fact that the pilot breathes pure oxygen continuously through his mask from the moment he leaves the ground, or even for half an hour before the take-off.

At 50,313 feet the atmospheric pressure is only 86 mm. of mercury, whereas at sea level the barometric reading is 760 mm. of mercury under standard conditions. Atmospheric pressure at such great altitudes has been determined by means of instruments attached to captive balloons or by a barometer fastened to the exterior of a sealed pressure cabin or gondola.

The partial pressure of water vapor in the lung alveoli at all altitudes amounts to 47 mm. of mercury and remains constant until death. The partial pressure of carbon dioxide in the lungs at 50,313 feet above sea level is 39 mm. of mercury. Therefore, the tension of oxygen in the alveoli at this extreme altitude falls to zero, even though the oxygen be administered by a mask in 100 per cent concentration. Barometric pressure at an altitude of 50,313 feet, 86 mm. of mercury, less alveolar water vapor, 47 mm., plus CO_2 tension, 39 mm., is equivalent to

86 mm. of mercury, minus 47 mm. of mercury, plus 39 mm. of mercury equals

$$86 - 86 = 0$$

The absolute ceiling for man in an open cockpit plane is accordingly in the neighborhood of 50,000 feet or less. For all practical purposes the ceiling lies between 42,000 to 45,000 feet because of variable individual tolerance to anoxia and by reason of other factors, such as cold, the formation of nitrogen emboli in the blood stream, and similar conditions. Unconsciousness rapidly supervenes when the oxygen dissociation curve of arterial blood falls below 30 or 40 per cent, as it does when the oxygen tension in the pulmonary alveoli is reduced to 20 or 30 mm. of mercury. This occurs at an altitude between 45,000 to 50,000 feet.

Many an armchair pilot and erstwhile student of aviation medicine, not to mention an aggressive motion picture producer, has jumped to the conclusion that the problem of anoxia in the stratosphere could readily and easily be solved by the use of a pressure suit or a pressure cabin to surround the pilot at all times with a tolerable atmosphere. Indeed, this principle was put to test with great success by Stevens and Anderson, who ascended in a sealed gondola during peacetime to the amazing, record-breaking height of 72,000 feet in 1936.

However, the sealed pressure cabin or pressurized suit to be worn by the pilot is impractical at the present time in modern military aviation for several reasons. If a leak should develop in the suit or if the cabin be perforated by machine gun bullets or by a shell from a 37 or 50 mm. cannon during combat, sudden decompression of the pilot would occur with almost explosive violence. The speed or force of this decompression would depend on the pressure differential between the interior and exterior of the suit or cabin. The higher the altitude the greater would be this pressure differential. The decompression velocity would also vary with the size of the leak in the pressurized suit and the size and number of the holes shot through the pressure cabin.

This rapid decompression would cause acute oxygen starvation, the acuteness of the anoxia depending again on the velocity of the decompression. The loss of consciousness might supervene in a fraction of a second and death ensue long before the plane could fall to an altitude of around 20,000 feet, where the partial pressure of oxygen in the atmosphere is sufficient to sustain life. Nor is extreme, acute anoxia the only danger to consider in an explosive decompression. Severe aeroembolism is an almost certain hazard in such a series of fortuitous circumstances. Aeroembolism is a disease produced by a rapid decrease in barometric pressure and is characterized by the formation of nitrogen bubbles or emboli in the body fluids, such as the blood and cerebrospinal fluid. Its causative factors are essentially the same as in the case of bends or caisson disease occurring in deep-sea divers who are decompressed too rapidly.

Whenever atmospheric pressure is decreased the partial pressure of nitrogen in the body fluids and tissues is relatively greater than that of the nitrogen in the alveolar air; in other words, under such circumstances, the body is temporarily supersaturated with nitrogen. If the ascent is gradual, a sufficient equilibrium will be established between the body nitrogen and the partial pressure of the nitrogen in the alveolar air to prevent the development of embolic symptoms. If, on the other hand, the ascent is rapid and the fall in barometric pressure equally rapid by inverse ratio, the equilibrium will be overcome and the nitrogen in the body will vaporize in the form of millions of gas bubbles in the blood, the spinal fluid, and the tissues. This is particularly true of the fatty tissues of the body, since nitrogen is more soluble in fats and oils than in water. When these nitrogen bubbles appear in the blood stream in sufficient number and size, and their appearance may be almost instantaneous in an explosive type of decompression, they cause a mechanical obstruction to the flow of blood with resultant sudden and severe anoxia. Nitrogen bubble emboli may embarrass the coronary circulation of the heart and cause angina pectoris or even coronary occlusion; they may precipitate acute failure of the kidneys, liver, or other viscera, and produce paralysis or hemiplegia, apoplexy, in the spinal cord and brain.

There is yet another hazard incident to the rapid fall in barometric pressure and therefore applicable to flight at extremely high altitudes. It is the hazard incident to the distention of gases according to Boyle's law, which states that the volume of a gas is inversely proportional to the pressure upon it. As altitude is gained there is a concomitant fall in barometric pressure with resulting distention of the free gases in the stomach and intestines, and also of the air in the middle ear. For instance, at 42,000 feet the atmospheric pressure is one-sixth of the normal pressure of the atmosphere at sea level. At 42,000 feet the volume of intestinal gas will be six times its original volume at the airport. The resulting distention is a constant source of discomfort to the aviator since it forces the diaphragm upward and thereby embarrasses both the respiration and cardiac action. Its danger lies inherent in the potential rupture of a stomach ulcer because of this distention. In the middle ear the same phenomenon will cause either hemorrhage or perforation of the drum, aero-otitis media. Patients with pneumothorax or collapsed lung are faced with a special danger during aerial transportation because of the expansion of the air trapped within their pleural cavity and should never attempt or be subjected to high altitude flying.

One of the most difficult and interesting problems facing aviation medicine today is a study of speed and acceleration and the effect of these forces on the human organism.

It may be stated almost as an axiom that if speed be defined as a constant velocity in a straight line its action on the human body is nil, provided that secondary effects of wind pressure are eliminated. However, any change in the rate or direction of the velocity produces an acceleration. In aviation, accelerations occur during a change of direction in flight because of the positive or negative lift of the airplane's wings. It is therefore spoken of as a "positive" or "negative" acceleration in relation to the constant pull of gravity, and since an airplane in flight can rotate about any of its three axes, horizontal, perpendicular, or transverse, acceleration must further be classified as linear, centrifugal, and angular. In addition, the action of the plane's propellant and braking forces are independent of the constant pull of gravity and also are exerted along the aircraft's three coordinate axes in determining the airplane's position in space.

The effect of these forces on the living organism is attributable to the fact that whenever a force is applied in one direction by the airplane an equal but opposite force is applied to the pilot because of the inertia or mass of his body. Weight is proportional to mass and also is a measure of the force of gravity. It is therefore both logical and appropriate to use the force of gravity, G, as the unit for measuring acceleration. Linear acceleration is the force necessary to overcome inertia, and centrifugal acceleration is the force required to constrain a body to move in a curved path, as in a curved or curving flight.

The amount and direction of gravitational pull are essentially constant, but the force of gravity acts alone only when the airplane is in level flight and at a constant velocity. At all other times the aircraft is acted upon by numerous forces whose vectors are determined by the degree of rotation of the plane about its three axes, the positive and the negative lift of its wings, and also from its propellant and braking or dragging forces, as previously noted. By common terminology, an acceleration whose force is exerted upward, perpendicular to the line of flight, is said to be positive or plus G; an acceleration whose force is exerted downward at right angles to the line of flight is called a negative acceleration or minus G. Thus, when the motion of an airplane acts on the body of the pilot in a line extending from buttocks to head, the inertia of his body acts in the opposite direction from head to buttocks. Such a force is considered to be a positive acceleration, plus G, and is encountered or experienced by the pilot during a pull-out from a dive. A negative acceleration, from buttocks to brain, occurs in certain acrobatic maneuvers such as outside spins, inverted spins, outside loops and pushovers, and during inverted flight.

The symptoms produced in the human body will depend on the force, direction, and duration of the acceleration. Accelerations exert their force on the body fluids, the organs suspended within the body cavities, the soft supporting tissues, and the body framework. The effect of positive centrifugalization is to drive the abdominal viscera downward into the pelvis, to drain the blood from the head and upper extremities through the right auricle of the heart down into the vena cava inferior and its branches, and force it into the veins of the splanchnic area and lower extremities. As a result of this terrific suction, the brain is rapidly drained of its blood, cerebral anemia develops almost immediately, blindness occurs and is quickly followed by unconsciousness, the so-called blackout of the aviator. A similar hydrostatic action occurs in the cerebrospinal fluid which is rapidly drained away from the ventricles of the brain, with collapse of the soft tissues within the skull and their impingement on the bony floor of the calvarium.

In negative accelerations the same hydrostatic forces are created but act in a reverse direction, crowding the abdominal viscera upward against the diaphragm, crushing the thoracic contents into the superior mediastinum, producing hemorrhage from the lungs, and forcing the blood and spinal fluid toward the brain, with a tremendous increase in intracranial pressure and concomitant retinal hemorrhage and apoplexy. Accelerations along the transverse axis of the body are the least harmful and also the least frequent, as when the pilot takes off from a catapult or negotiates an arrested landing on the deck of an aircraft carrier, but they will doubtless acquire great importance when flights in rocket planes become practical. Angular acceleration, as in spinning, whirling, and similar motions, produces vertigo, nausea, vomiting, airsickness, apathy, and collapse but causes no permanent ill effects and has not of itself been known to cause death, except secondarily as a result of loss of equilibration.

Protective devices designed to combat the force of acceleration or to alleviate the physical hazards produced thereby are under constant study and experimentation. For instance, human centrifuge machines have been built and are in operation with this problem in mind. Other subjects under study in the field of aviation medicine include the analysis and prevention of aircraft accidents, the role of the cortical adrenal hormone in anoxia, and the frequency of injuries to the vertebral column, notably rupture of the nucleus pulposus, during dive-bombing operations where the force of acceleration during the pull-out may reach plus 6 G or even plus 8 G.

Indeed, a vast literature pertaining to the work of the flight surgeon has appeared chiefly since the last war. A recent cumulative bibliography comprises 6000 titles by 19,000 authors. The subject matter covers a vast range of the physiology, pharmacology, and psychology of flight. The selection of cadets for flight training has practically become a specialty in its own right. This examination alone includes the observation, recording, and interpretation of over eighty physical and psychologic characteristics in the case of each cadet. Many investigators specialize in research pertaining to the training and performance of the aviator, the problem of fatigue, the transportation of patients by airplane, the use of paratroops and parachute physicians, and numerous other additional problems pertaining to aviation medicine.

Air supremacy involves not only the selection, study, and care of the flying personnel but also of the ground personnel. For every man in the air there are nine or ten men on the ground, both in civil aeronautics and in military aviation. If the program to achieve air supremacy requires 100,000 pilots, it is necessary to enlist the services of 1,000,000 men in aviation. The care of the flyer is not synonymous with physical fitness; the problem is one of preservation of that physical fitness and can be solved only by a physician who has had special training in the recognition and handling of the physiologic and psychologic stresses and strains to which the military pilot is subjected.

To better accomplish his mission the flight surgeon should acquaint himself with as many aspects of aviation as possible; he should attend classes in ground school instruction, radio, navigation, meteorology, and in principles of engineering. He should also learn to fly and be able to pilot various types of aircraft if necessary. He should acquaint himself at first hand with the hazards and emergencies of flight, the better to meet them face to face when they appear without warning. Finally, he must be ready at all times to care for the injuries resulting from contact with the enemy, from forced landings, collisions, and crack-ups.

The field of aviation medicine is expanding so rapidly and the opportunities are so great that new problems are encountered more rapidly than old ones can be solved. Herein lies the challenge of a new frontier. And that challenge is being met by the flight surgeons, who of themselves possess a keen and active interest in aviation and a large measure of the pioneering spirit of research so essential in their specialty. Progress in aviation is dependent upon and directly proportional to progress in aviation medicine.

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TRICHINOSIS MISDIAGNOSED AS SCARLET FEVER*

With Case Reports

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Spink and Augustine (1) have reported that the skin manifestations in trichinosis are relatively uncommon and seldom discussed. In their series of cases they noted two patients who had a maculopapular eruption on the abdomen closely resembling rose spots, while two others had an erythematous lesion not unlike that found in scarlet fever. There was one case each resembling erythema multiforme and furunculosis. In one patient small elevated erythematous lesions developed under the skin of both palms. Two other interesting skin manifestations were those resembling angioneurotic edema and erysipelas. Thompson (2) has noted an erythema of the face and neck and sometimes over the body, herpes labialis, urticaria, and abdominal rose spots resembling the roseola of typhoid fever. Garland (3) has mentioned pruritus. Manson-Bahr (4) found that edema of the face, abdomen, and legs was often noted. He has also seen intense pruritis and sometimes skin eruptions. A résumé of a number of outbreaks of trichinosis picked at random from the literature revealed that typhoid fever is most commonly confused at first with trichinosis. The long duration of the fever, frequently of the continuous type, and the appearance of rose spots resembling those of typhoid, though never appearing in crops, add to the confusion. Sutton (5) has reported a case of trichinosis with scarlatiniform eruption associated with edema of the lower lids.

When the writer was resident physician at the Meadowbrook Hospital two interesting families were observed in the contagious division. In one family, admitted as scarlet fever cases, two of the three patients actually had rashes on their bodies. The other family, which had been under observation six months previously, was admitted as suspected scarlet fever contacts under circumstances which will be noted under the discussion of their cases.

CASE REPORTS

Case No. 1: T. V., Hospital No. 5250, was admitted on August 13, 1936 and discharged on August 23, 1936.

Three days before admission the patient complained of sore throat and malaise. On August 12 a rash developed over the entire body. He was seen by his local physician, a

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diagnosis of scarlet fever made, and the patient was sent to the contagious division of the Meadowbrook Hospital.

The past history revealed whooping cough, measles, mumps, and chickenpox.

A physical examination showed a well developed and fairly well nourished white male child, 7 years of age, who did not appear uncomfortable but complained of a sore throat. His temperature was 100.4 F. rectally, the pulse rate was 80 per minute, and the rate of respiration was 20. The entire body, arms, legs, and trunk, with the exception of the face, was covered with a fine erythematous, follicular rash. The tonsils were hypertrophied and the pharynx was red. The beefy appearance of the throat and the strawberry color of the tongue so characteristic of scarlet fever were absent. The rest of the examination was essentially negative.

Laboratory findings: August 16, 1936: Examination of the blood showed hemoglobin 70%; red blood cells 4,200,000; white blood cells 16,000; polymorphonuclears 46%; eosinophils 7%; basophils 1%; monocytes 7%; lymphocytes 39%.

The urinalysis was essentially negative.

On August 21, 1936 the examination showed polymorphonuclears 44%; eosinophils 10%; monocytes 7%; lymphocytes 39%.

No hemolytic streptococci were found in the nose and throat cultures.

Course in the hospital: The rash faded away rapidly and was gone in two days. The temperature became normal in twenty-four hours under symptomatic treatment and did not rise again. The patient was discharged on the eleventh hospital day.

Case No. 2: F. V., Hospital No. 5312, was admitted on August 17, 1936 and discharged on August 23, 1936.

Three days before admission the patient began to complain of generalized malaise. There was no history of sore throat. On August 16 a fine rash appeared on the patient's body and because his brother had been sent to Meadowbrook Hospital with a rash diagnosed as scarlet fever, the patient was admitted with the same diagnosis.

The past history revealed mumps, measles, chickenpox, and double pneumonia.

A physical examination revealed a pale, white, 4 year old boy lying quietly in bed, not acutely ill. His temperature was 100 F. rectally, the pulse rate was 110 per minute, and the rate of respiration was 24. There was a fine follicular rash over the entire body, especially marked on the chest and neck. The physical examination was negative, except for a slightly reddened pharynx and decidedly hypertrophied tonsils. The beefy appearance of the pharynx and the strawberry color of the tongue associated with scarlet fever were lacking.

Laboratory findings: August 17, 1936: Examination of the blood showed hemoglobin 84%; red blood cells 4,000,000; white blood cells 15,760; polymorphonuclears 36%; eosinophils 20%; lymphocytes 39%; monocytes 5%.

On August 21, 1936 the findings were white blood cells 17,000, polymorphonuclears 30%; eosinophils 8%; lymphocytes 53%; monocytes 9%.

Urinalysis: Several specimens were negative.

Nose and throat cultures: No hemolytic streptococci were seen.

Course in the hospital: The temperature was 100 F. for twenty-four hours. It then became normal and did not rise again while the patient was hospitalized. The rash gradually faded away and disappeared entirely on the sixth day.

Case No. 3: D. V., Hospital No. 5313, was admitted on August 17, 1936 and discharged on September 3, 1936.

The chief complaint was fever, malaise of two days' duration, sore throat, and swelling of the eyes of one day's duration.

The patient was well until two days before admission, when she began to have generalized aches and pains, with a temperature rising up to 103 F. The next day her temperature was 104 F. and she complained of a sore throat. A swelling was noticed under both eyes. Since one brother had developed a scarlatiniform rash and was hospitalized at Meadowbrook four days before, and because another brother had a scarlatiniform rash also, she was sent to the hospital with a diagnosis of scarlet fever exposure and possible nephritis on account of the swelling under the eyes.

The past history revealed scarlet fever in 1928, whooping cough, measles, mumps, and chickenpox.

A physical examination showed an acutely ill, pale, thin, undernourished white female, 11 years of age, with the complaint of headache and sore throat. Her temperature was 104.4 F. rectally, the pulse rate was 116 per minute, and the rate of respiration was 20. There was edema of both lower lids. The rest of the examination was essentially negative, except for a systolic blow over the apical region.

Laboratory findings: Examinations of the blood on the following dates showed:

	8/17	8/21	8/26	9/1	11/13
Hemoglobin	72%				
Red blood cells	4,900,000				
White blood cells	5400	5240	8800	12,700	7000
Polymorphonuclears	63%	53%	47%	39%	29%
Eosinophils	10%	33%	27%	29%	8%
Basophils	2%	1%			
Monocytes	2%	1%	5%	4%	4%
Lymphocytes	23%	12%	21%	27%	58%

The blood chemical examination was reported as follows: urea nitrogen 11 mg. %; creatinine 1.5 mg. %; sugar 95 mg. %.

No trichina were found in the centrifuged blood.

The stools were negative for ova and parasites on August 26 and 27, and September 2.

Urinalysis: Several specimens were negative.

Course in the hospital: On August 18 the patient's temperature rose to 104 F. and to 105 F. the following day. She complained of severe headache and on August 19 was given 0.2 gm. of neoarsphenamine. The temperature fluctuated between 101 and 104 F. On August 21, 0.3 gm. of neoarsphenamine was administered, and on August 23 the dosage was 0.4 gm. A diffuse urticarial rash developed on August 24. It was attributed to the arsenical, which was therefore discontinued. The temperature ranged between 99 and 103 F., gradually finding lower levels, and finally became normal on August 30. There were no further changes for the next five days and the patient was discharged.

Her whole course was characterized by severe headache, depression, fever, and malaise.

When the eosinophilia and the general clinical picture led to the suspicion of trichinosis, questioning revealed that the entire family had eaten a meal of fried pork on August 9, 1936. Blood counts were then taken on the mother and four of the other children. The report on the mother showed eosinophils 84% and the children's eosinophil counts ranged between 15 and 35%. Not one of the members of this family had any complaints referable to any of the systems and they were going about their daily tasks as usual.

A second family of three was admitted because of fever, extensive aches and pains, malaise, and a general infectious syndrome. About one week before the father and two sons were admitted, the daughter of the family had the same series of symptoms. Two days later she was seen by the family physician because of a generalized rash over the body which he diagnosed as scarlet fever. This lasted for about four days and gradually disappeared. The temperature returned to normal about the same time and all symptoms disappeared. The temperature returned to normal about the same time and all symptoms disappeared. When the father and two sons became ill, the physician deemed it advisable to remove them to the contagious division of the Meadowbrook Hospital because of the home conditions. They were admitted with the diagnosis of pre-eruptive stage of scarlet fever because of contact with a case of scarlet fever in the family. Unfortunately, the girl never came under observation and no studies of any character were made upon her. The three cases are worthy of review because they demonstrate the protean manifestations of the disease.

Case No. 4: J. K., Hospital No. 2449, was admitted on January 8, 1936 and discharged on February 29, 1936.

The chief complaints were aches and pains throughout the body, headache, fever, and constipation of five days' duration beginning January 3, 1936. He was awakened from his sleep five days previously with a severe headache. The next day he felt dizzy and weak, and the third day he had chills and fever. Because of exposure to a daughter who had had a scarlatiniform rash, he was admitted with the diagnosis of possible early scarlet fever. The past history was essentially negative.

A physical examination revealed an acutely ill, 37 year old white male. His temperature was 103 F. rectally, the pulse rate was 120 per minute, and the rate of respiration was 20. The throat and tongue were not characteristic of scarlet fever, and the skin was clear. The rest of the examination was essentially negative, except for severe prostration.

Laboratory findings: Examinations of the blood on the following dates revealed:

	1/9	1/13	1/16	1/17	1/20	1/27	2/3	2/11
Hemoglobin......	73%	84%	84%					72%
White blood cells.	12,000	13,000	14,000	16,000	10,000	11,000	5800	
Polymorphonuclears..........	72%	57%	61%	59%	59%	75%	78%	
Eosinophils......	3%	38%	29%	33%	26%	8%		
Basophils........			2%	1%		6%		
Endotheliocytes..	5%	5%			6%			
Lymphocytes....	20%		8%	1%	9%	11%	22%	

The Wassermann and Kahn tests for syphilis were negative.

Urinalysis: Eighteen examinations made at frequent intervals were entirely negative.

Blood cultures made on January 12 and 14 proved negative.

Examination of the blood for trichina was negative.

Roentgen ray examination of the chest: No abnormalities were found.

Agglutination tests: Examinations for typhoid, paratyphoid A and B, B. tularensis and B. abortus were negative.

Spinal fluid: Test made on January 23 was negative for trichina.

Biopsy of gastrocnemius muscle: Sections on January 22 showed an exudate composed of large mononucleated cells and eosinophils in the interstitial tissue of muscle. No encysted parasites were seen.

Diagnosis: Subacute interstitial myositis.

Course in the hospital: For two weeks the temperature ranged between 99 and 105 F.; the third week from 99 to 102 F.; in the fourth week it rose to 104 F.; during the fifth week it was between 99 and 101 F.; for the sixth week it was from 99 to 100 F.; and for the last two weeks the temperature was entirely normal.

Case No. 5: L. K., Hospital No. 2353, was admitted on January 8, 1936 and discharged on January 15, 1936.

The chief complaints were malaise of eight days' duration, cough and fever of four days' duration, together with severe headache.

The physical examination revealed a subacutely ill white male, age 5 years. His temperature was 101 F. rectally, the pulse rate was 100 per minute, and the rate of respiration was 20. The skin was clear. The pharynx was moderately injected and the tongue slightly coated, neither symptom being characteristic of scarlet fever. The left ear drum was dull and reddened.

Laboratory findings: Examination of the blood showed hemoglobin 72%; white blood cells 11,800; polymorphonuclears 58%; eosinophils 9%; monocytes 5%; lymphocytes 28%.

Urinalysis: The urine was found to be negative.

Course in the hospital: There were no complications. The temperature dropped to normal on the second day and there were no further changes. The throat and ear cleared up rapidly. Only one examination of the blood was made. However, the percentage of eosinophils may be considered as more than suggestive in view of the family history.

Case No. 6: E. K., Hospital No. 2450, was admitted on January 8, 1936 and discharged on January 15, 1936.

The chief complaints were headache, generalized aches and pains, malaise, fever, and chilly sensations, preceded by headache and constipation for several days.

A physical examination revealed a white, 7 year old male, not appearing acutely ill, lying quietly in bed and complaining of headache. His temperature was 101 F. rectally, the pulse rate was 100 per minute, and the rate of respiration was 22. The conjunctiva were moderately injected, the pharynx somewhat reddened, and the tongue coated. However, the appearance of the pharynx and tongue was not characteristic of scarlet fever. The skin was clear. The left ear drum was red and slightly injected. There was a soft apical systolic blow. The rest of the examination was negative.

Laboratory findings: An examination of the blood was reported as follows: hemoglobin 73%; white blood cells 8550; polymorphonuclears 31%; eosinophils 38%; basophils 1%; monocytes 5%; lymphocytes 25%.

Urinalysis: The urine was found to be negative.

Course in the hospital: A skin rash never developed. The temperature became normal on January 10, the headache disappeared, and the patient was discharged on the seventh day. Only one blood examination was made. The extremely high eosinophil count and the subsequent family history seemed to confirm the diagnosis of trichinosis in this case.

When the laboratory findings revealed the high eosinophil count for these three patients further questioning elicited the information that on Christmas Eve, December 24, 1935, these people were the recipients of freshly killed pork distributed by the local fire department to indigent inhabitants of the village because of the holiday. A diagnosis of trichinosis caused by insufficiently cooked pork was made.

COMMENT

The six cases reported are interesting because of the diagnosis of scarlet fever made in one family on account of a scarlatiniform rash in two members, and in the other family because of exposure to a suspected scarlet fever case, which in the light of subsequent events must also have been a case of trichinosis with rash. It is to be noted that none of the six cases, including the two with the scarlatiniform rash, showed any of the signs associated with scarlet fever, such as a strawberry-colored tongue, a beefy red throat, or hemolytic streptococci in the pharynx.

The symptoms in all these cases were those of a general infectious syndrome. Only one, Case No. 3, developed a typical edema of the face usually associated with trichinosis.

In Case No. 4 the patient's course was typical of typhoid and he remained in the hospital for fifty-two days. Cases No. 1, 2, 5, and 6 may be considered as relatively mild. The patients were hospitalized for ten, six, seven, and seven days respectively, and the temperatures ranged from 100 to 101 F. rectally. The patients in Cases No. 3 and 4 had temperatures over 104 F. and were quite sick, although the former stayed only seventeen days and the latter for fifty-two days. The eosinophil counts and clinical severity of the disease did not parallel each other. In the mild cases, No. 1, 2, and 5, the eosinophil counts ranged from 7 to 20 per cent; the count in Case No. 6 was 38 per cent. The severe cases, No. 3 and 4, had counts of 33 and 38 per cent respectively as the maximum, whereas the mother of the first family was asymptomatic with an eosinophil count of 84 per cent. In none of these cases was trichinosis suspected until the laboratory reports revealed the high eosinophil counts. Adequate questioning brought out a definite history of the ingestion of pork in each case within a reasonable length of time before symptoms set in.

In the opinion of Hall and Collins (6) the most serious gap in the knowledge of trichinosis, so far as medical practice is concerned, is ignorance of the clinical syndrome. The classical description as given in the text and reference books is greatly oversimplified and represents only a composite record that is ascertained for the most part from epidemics of severe clinical trichinosis. The wide range of tissues damaged gives rise to numerous cases in which the predominant symptoms are those of infectious diseases other than trichinosis, of heart disease, of respiratory disease terminating in pneumonia, of meningitis and other disturbances of the nervous system, of eye lesions, and many other conditions. Approximately fifty diseases are listed that were obtained from clinical records which have been confused with trichinosis.

Hall and Collins have reported an incidence of 13.67 per cent of trichina in 300 cadavers from eleven hospitals in Washington and Baltimore. In summarizing the results of previous investigators with their own, they showed the presence of trichina in 222 of 1778 cadavers, an incidence of 12.5 per cent. Not one of the 222 cases was ever diagnosed as trichinosis, in spite of the fact that trichina sometimes were present in amounts up to almost 1000 per gram of muscle. They drew the conclusion that the United States, so far as the evidence is available, has the greatest problem of trichinosis of any country in the world, that it apparently involves millions of persons, and that trichinosis is a major public health problem here.

CONCLUSIONS

1. Two families of three persons each are reported hospitalized for scarlet fever who are later found to be suffering from trichinosis.

2. In two of the cases a scarlatiniform rash is seen which resembles scarlet fever, but no other clinical signs are present to confirm the diagnosis of scarlet fever.

3. Trichinosis is unsuspected until the blood counts reveal eosinophilia not only in the hospitalized cases, but also in other members of the family who are not clinically ill with the disease.

4. Another disease, scarlet fever, which has been reported only twice before, is added to the already confusing clinical features associated with trichinosis.

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PROCEEDINGS
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ONE HUNDRED AND TWENTY-NINTH PROGRAM MEETING

The One Hundred and Twenty-Ninth Program Meeting was held on October 13, 1943 at 4:00 P.M. in the Bressler Lecture Hall.

The following program was presented:

"A Study of the Optical Isomers in the Ephedrin Series," by Dr. W. H Hartung and Charles Jarowski, School of Pharmacy, University of Maryland.

"Studies in Sulfonamide Toxicity—Heinz Bodies in the Blood of Mice Treated with Sulfonamides," by Dr. F. H. J. Figge, Department of Gross Anatomy, School of Medicine, University of Maryland, and Pfc. Perry Futterman, A.U.S.

A business meeting of the Society was held on November 10, 1943 at 4:00 P.M. in the Bressler Lecture Hall, at which the following officers were elected:

President: Dr. Edward C. Dobbs
Secretary: Dr. Walter L. Hard
Treasurer: Dr. Glenn S. Weiland
Councilor: Dr. William E. Hahn
Secretarial Representative at College Park: Dr. Ronald Bamford

The following candidates were elected to membership:

Full membership: Dr. Marie A. Andersch
Dr. F. G. Evans
Dr. Paul A. Hansen
Associate membership: Miss Ruth M. Blackwell

ONE HUNDRED AND THIRTIETH PROGRAM MEETING

The One Hundred and Thirtieth Program Meeting took place on November 10, 1943 at 4:00 P.M. in the Bressler Lecture Hall.

The program consisted of a paper on "The Life Cycle of Carcinoma of the Stomach," by Dr. Maurice Feldman, Department of Gastroenterology, School of Medicine, University of Maryland.

An abstract of this paper follows.

THE LIFE CYCLE OF CARCINOMA OF THE STOMACH

A Report of Three Interesting Cases of Carcinoma of the Pylorus

Maurice Feldman, M.D.*

One often wonders how long a carcinoma has been present before it is recognized. Three interesting cases are reported because they show that either carcinoma or a pre-carcinomatous lesion was present for a number of years before a definite diagnosis was made.

The three cases of carcinoma of the stomach closely paralleled each other. They presented the clinical picture of peptic ulceration with periods of remissions. These cases had similar roentgen findings of narrowing of the prepylorus involving both curvatures, and fixation of the curvatures with a plateau appearance of the lesser curvature in the affected area. They were slow growing carcinomas, extending over many years. Two of the patients had persistent low gastric acidities, while one showed a persistent hyperacidity throughout the entire course of the illness. All three patients finally developed a pyloric obstruction as the result of an inoperable carcinoma.

Negative roentgenologic information with regard to the integrity of the stomach often gives a sense of false security. The demonstration of a narrowing of the pylorus should lead one to suspect a possible lesion. It is noteworthy to point out that in a patient with a digestive disorder presenting a negative gastrointestinal study, who is clinically progressively getting worse or is not improving, there is a strong suggestion of an organic lesion somewhere in the gastrointestinal tract and repeated interval roentgen studies must be made.

The roentgenologist will at times find some changes in the pylorus, such as narrowing and thickening, which should be mentioned even though the true nature of the condition cannot be established definitely. Clinically, the patient may not manifest symptoms to warrant surgical intervention. Often the surgeon is not courageous enough to explore the stomach, because of the lack of symptoms when a suspicious organic lesion is demonstrated by the roentgen ray examination.

These cases present an interesting picture of the life cycle of carcinoma of the stomach. Repeated roentgen examinations were made at intervals in each case over a number of years and these permitted the study of the sequence and progress of the growth from the early onset to the final stage.

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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1944

NEWS FROM THOSE IN THE ARMED FORCES

February 6, 1943

ABSTRACT FROM A NORTH AFRICAN DIARY

The last two days have been the most interesting that I can recall having spent. The occasion was a tour of inspection into the interior of this land with the director of the regional health service. The main interest was typhus fever, since there was occurring at this time an epidemic among the indigent population in an area near the Atlas Mountains. This inspection was considered of importance because of the continual migration of the native population from the country into the urban areas where contact could be made, in one form or another, with the American soldier.

At 8:00 a.m. we left by automobile and when we were outside the city limits were able to see a most beautiful sunrise, which is as typically African as are the sunsets. We traveled for miles and saw few trees; the grass was quite green and the countryside dotted with thatch huts, and here and there white concrete structures marking the homes of the more fortunate Arabs. We passed and bypassed numerous small villages always described by my companion as *tres joli*. After traveling through the rolling type of country we came in view of the Atlas Mountains and they were indeed magnificent. The peaks were snowcapped and the hills were a great relief to the monotonous countryside.

I saw for the first time almond trees in full bloom and fully realized the meaning of the passage in Ecclesiastes saying "The almond tree shall flourish." I viewed for the first time also groves of olive trees, which are not in evidence along the coast. The town was old and dirty but *tres joli*, according to my companion, so I chimed in with *oui, oui*. We reached the home of the local physician, Dr. Magenc, a young fellow educated in France. The house was clean and well kept. There is no domestic problem here. From the front porch the garden was beautiful with hibiscus, poinsettia and bougainvillea just coming into bloom, geranium, and numerous orange and lemon trees. We settled down to a dinner served by Arab hands. It consisted of soup, cold meats and numerous hors d'oeuvres, potatoes, never hard to digest, a course of water cress and, with the latter, one's thoughts easily imagined what intestinal disease might just be beginning its period of incubation. During the meal we had butter, a rare visitor to the table. Dessert was the conventional fruit, always welcome. Coffee was served at the end of the meal and I was beginning to wonder just what kind of a typhus mission this was becoming.

We first visited the town hospital reserved for cases coming from the village proper. We entered the hospital, a place giving the impression of being in desolation and ruins. It was in the heart of the town. We visited the delousing unit which resembled a broken down, desolate garage. In the room there was a hole in the ground in which the sulfur was burned. There was a small rack for the clothes or, more appropriately, rags. Around the corner from this unit we went into what I was told was the ward for the women and convalescents. The room was damp, wet with dirty, foul smelling water, and on a concrete elevation there were twenty women sick, dying and walking, all previously having been the host for that little scourge, the louse. There were no beds or blankets and all rested on a cold damp floor. We were then conducted to the "very sick" and male ward. This was out in the open, with men and boys sick with typhus fever lying on the ground, a few having a stuffed goat's skin for a pillow. I counted thirty-two here and on inquiring learned that the mortality rate for the present epidemic in this region was about 25 per cent, the epidemic having started in the middle of December. The rounds of the local physician consisted of calling out the names. If the patient could answer he replied. The examination consisted of feeling the patient, perhaps to determine the feeling of warmth. The tongue was examined and was the main index as to etiology, progress, prognosis, etc.

From this hospital we went two or three miles in the country and had another unforgettable experience. Here the indigent did not have the comfort of a hospital but were garnered in a small group, the whole area being called a "lazaret." The confine consisted of six or seven thatch huts and a few canvas tents, all being enclosed in a wall. The patients were actually lying on the ground and it was cold at this time of the year. Women infected with fever were nursing infants likewise ill with typhus. Some were dying and others were ready for discharge. In this particular spot we saw sixty cases and several hundred feet away from the sick was the burial ground, convenient but hardly stimulating. As we left the lazaret, on the outside of the wall were anxious folk who, while they awaited news, washed their clothes in a nearby stream.

The next lazaret visited was one of a few old clay huts with many sick but most well enough to nod their heads or give a half salute. The procedure of admission of the sick to these groups is interesting and sound in policy. Each small area is governed by a responsible person, be he a caid, a pasha, or other official. It is the responsibility of his henchmen to hunt out the sick and persuade or forcefully conduct them in, a good arrangement under the existing conditions since the native, whenever possible, shuns the lazaret for the seclusion of his hut where there is no possibility of having his hair cut or of getting a bath, where he is free to infest all of the others in his household not immune by grace of a past infection of typhus.

We returned to the doctor's house for an inspection of his attached infirmary,—a most pitiful sight. There were a few cases admitted here that showed the most serious type of typhus other than death. A man in his twenties had his typhus complicated by a bilateral "arteritis," as the French call it. He had a complete slough of one-half of the left leg, with only the tibia remaining. On the other leg he had sloughing with both the tibia and fibula clearly visible for six inches. Below this the foot was dry and cadaverous.

A bit of fruit and then off to another lazaret. Here we saw a large group of typhus cases all assembled in a large native type hut. A native mother, dressed in rags, came while we were there. She went about her mission and nursed her small infant sick with typhus, since she herself was not ill and not permitted to stay. Her immunity apparently came from an epidemic of other years.

On the way back to town we stopped at the house of a M. Daladier, a first cousin of the former premier of France. This man was most cordial. He had a small farm and vinery. We found their chief product, white wine, most refreshing, also a few olives which took the edge off of a rapidly growing appetite.

I learned that in this small province there had been 500 cases since December and we saw close to 400 today. The mortality was about 25 per cent. Parotitis was infrequent and some cases of arteritis had occurred, all resulting in amputation.

Wild boar was the main course at dinner. The meal was delicious and tasty, even the leafy foods this time. We had white wine with the meal and coffee afterward. The next morning we bade farewell and crossed over from the main road to a transcountry canal used for irrigation and also the cultivation of mosquitoes. We finally reached our destination, where the local comptroller was visited. Soon we met the local physician who was apparently disinterested in his practice. The infirmary, just under construction, was inspected.

Several miles from this town there was a large lazaret with many cases of quite sick typhus patients. Here there were facilities for delousing with a single team unit, and portable showers were being erected. The Arab dislikes these procedures and will make every effort to avoid hospitalization. For this reason it may be predicted conservatively that about one-fifth of those sick are actually controlled. From this group I took blood specimens for serologic study, but clinically nearly all cases were of the epidemic or classical European typhus.

By midafternoon we reached another small typhus isolation unit with more sick cases, swollen tongues, dry tongues, red tongues, smooth tongues, and all types of tongues. Those cases at the height of illness showed the classical rash, the high temperature, the delirium, and all of the usual signs. Toxicity was extreme; the dying had no pain; the convalescents were quite weak and washed out.

At this last lazaret we met Caid Bernaceur, with whom we were to dine. The next hours will always be remembered by me. I consider myself fortunate to experience it without going to Hollywood. This was the real McCoy. The uniform made me the guest of honor. The first greeting was a refreshing drink of native wine. Following this, Mohammed (nearly everyone has a Mohammed in his name) came to me with a silver tray in the center of which was a cake of soap. At this point my Arabian etiquette failed and my blunder was most obvious. In true Yankee fashion I grasped the cake of soap and had a good wash while Mohammed poured water on my hands. My embarrassment began when I noticed that my host and Dr. Flye graciously washed the right hand only, since the left hand does not function at mealtime at all. The first course served was a large silver tray containing three whole broiled chickens covered with an omeletlike affair more than an inch thick. We all began eating with the right hand, using only the thumb, index and middle fingers. Caid Bernaceur did not eat but concerned himself only with seeing that we were promptly served. The omelet was tasty and easily managed with the hand, but there was some difficulty at first in handling the chicken. We left enough of this plate for the kitchen help, according to custom, and this dish was soon replaced by a tender roast of beef, broiled potatoes, and a delicious sauce. Native bread was served with the meal, as was a tasty red wine. There is a neat trick in eating with the hands and one can get his share of the gravy with the proper use of the bread. The foods are all nicely spiced and served quite hot. The next dish was mutton spare ribs with carrots. The final meat course was in the form of a potpie. It was a flaky pielike dish made with eggs, pigeon meat, and sugar. It was crisp and light, almost melting in the mouth. The dessert consisted of a large bowl of very delicious cakes that can best be described as a sugared tart, crisp and light, and shaped like the horn of a gazelle. Digestion was then aided with an orange liqueur, after which the host offered choice cigarettes. I was glad to have a spare can of pipe tobacco for him. The meal had lasted two hours.

Caid Bernaceur accompanied us to the last lazaret, where we saw many more critically ill. It must be mentioned that this man and men like him are intelligent and realize fully the seriousness of typhus and all diseases. All that he could do, and he did that efficiently, was to see that sick people were segregated from healthy ones, and he did his best to cooperate with the vaccination problem. We bade our farewell here and left for the city. The sunset was beautiful this second day and a splendid climax to two fine days of new and different things.

THEODORE E. WOODWARD.

Capt. Joseph E. Schenthal, Class of 1939, has been awarded the Army's fourth highest decoration, the Legion of Merit, by order of Lieut. Gen. George H. Brett, commander of the Caribbean defense area. The citation read as follows:

> "Captain Joseph E. Schenthal, Medical Corps, Army of the United States. For exceptionally meritorious conduct in the performance of outstanding service from January 29, 1942 to March 9, 1943, as surgeon of a Coast Artillery regiment. From the beginning, Captain Schenthal displayed an extraordinary interest in his problems and particularly that of combating malaria. Largely due to his personal interest and efforts, high professional skill and devotion to duty, he was responsible to a marked degree for the sharp decrease in the malarial rate of his regiment. Entered military service from Maryland."

MISSING IN ACTION

Lieut. Joshua Warfield Baxley, III, M.C., U.S.N.R., of Ellicott City, Maryland, has been reported missing in action.

Lieutenant Baxley received his bachelor of science degree from the University of Maryland, and his degree in medicine from the School of Medicine in 1941. Following graduation he served as an intern in the University Hospital and at the end of the year asked to be released so that he could apply for a commission in the Navy.

Throughout his five years here as a student and an intern Lieutenant Baxley won the respect of his associates by his gentlemanly manner, pleasant and cooperative attitude, and wholesome traits of character. He had a cheerful, enthusiastic temperament and good scholastic standing, being in the upper third of his class during his four years at the School of Medicine. He was known to be sincere, reliable, and resourceful.

According to reports, Lieutenant Baxley was reported missing from the *Bristol*, which was sunk in the Mediterranean by a mine or torpedo.

PROMOTIONS

Ten officers attached to the 42nd General Hospital have been advanced one grade in rank. The promotions create two new lieutenant colonels, five majors, and three captains.

The two ranking highest on the list are Lieut. Col. Henry F. Ullrich, Class of 1929, Assistant Professor of Orthopedic Surgery at the School of Medicine, University of Maryland, and Lieut. Col. Brice M. Dorsey, Professor of Oral Surgery.

Other promotions include:

Major Arthur G. Siwinski, Class of 1931, Instructor in Surgery
Major Harry C. Bowie, Class of 1936, Assistant in Surgery and Gross Anatomy
Major Edward F. Cotter, Class of 1935, Instructor in Pathology, Assistant in Neurology
Major Walter E. Karfgin, Class of 1936, Assistant in Metabolism Clinic
Major C. Henry Jones, Class of 1936
Capt. Everett S. Diggs, Class of 1937, Assistant in Gynecology
Capt. Frederick J. Vollmer, Class of 1938, Hitchcock Fellow in Medicine
Capt. Ernest W. Mack

Lieut. Col. Walter C. Merkel, Class of 1926, Assistant Professor of Pathology, was promoted to his present rank about a year ago.

The following officers attached to the 142nd General Hospital have been advanced one grade in rank:

Major D. James Greiner, Assistant Professor of Pathology
Major Stuart G. Coughlan, Class of 1937, Assistant in Surgery
Capt. J. King B. E. Seegar, Class of 1937, Assistant in Obstetrics
Capt. William C. Humphries, Class of 1937, Assistant in Rhinology and Laryngology
Capt. Edwin O. Daue, Jr., Class of 1940, Assistant in Medicine
Capt. Robert L. Gibbs, Class of 1940, Assistant in Medicine

Other promotions include:

Lieut. Col. Henry V. Langeluttig, Class of 1931, Associate in Medicine. Colonel Langeluttig is head of the medical service of the 142nd General Hospital and was promoted shortly after his unit arrived at its South Pacific base.

Lieut. Col. Harry C. Hull, Class of 1932, Associate in Surgery. Colonel Hull is in charge of the surgical service of the 142nd General Hospital and was commissioned a major in the Army Medical Corps late in 1940, when the unit was organized at the University Hospital. He was promoted to his present rank about a year ago.

Major James B. Moran, Class of 1936. Major Moran was recently promoted from the rank of captain and is now executive officer of the 118th Medical Battalion in the area of A.P.O.43.

Comdr. Harry Goldsmith, U.S.N.R., Class of 1913, Assistant Professor of Psychiatry. Commander Goldsmith was recently promoted from the rank of lieutenant commander and is stationed at the U. S. Naval Hospital, Memphis, Tenn.

Comdr. C. A. Young, U.S.N.R., Class of 1914, promoted from lieutenant commander on December 5, 1942. Commander Young is chief of the eye, ear, nose, and throat service at the U. S. Naval Hospital, Bainbridge, Md.

Col. Bascom L. Wilson, Class of 1915, is chief surgeon of the Fifth Air Force somewhere in the South Pacific.

Lieut. Col. James E. Peterman, Class of 1924, now is medical inspector of a base section in a South Pacific combat zone.

Major Wilbur Starr Brooks, Class of 1938, is serving as radiologist with an advanced base hospital in New Guinea.

Major John C. Squillante, Class of 1940, is commander of a company in the 118th Medical Battalion, A.P.O.43.

Capt. Jacob M. Miller, Class of 1924, is ward officer of the 20th Station Hospital somewhere in the South Pacific, A.P.O.709.

Capt. Joseph Miceli, Class of 1940, commands a company in the 25th Medical Battalion, A.P.O.25. Captain Miceli formerly was a staff member of the 9th Station Hospital as ward and laboratory officer.

Capt. Pasquale A. Piccolo, Class of 1937, is flight surgeon with the 12th Fighter Squadron, A.P.O.709.

Capt. William T. Reardon, Class of 1934, is head of the eye, ear, nose, and throat section of the 27th Station Hospital, A.P.O.502.

Capt. Melvin N. Borden, Class of 1938, is serving as squadron surgeon with the 344th Service Squadron, A.P.O.708.

Capt. William C. Gordon, Class of 1937, is chief of the laboratory of a general hospital located near Allied headquarters.

First. Lieut. Herman Baylus, Class of 1939, is now in active service.

Capt. Daniel James Schwartz, Class of 1934, is post surgeon and aviation medical examiner at Darr Field, Albany, Ga.

The 42nd General Hospital recently moved from the hilltop convent school which they turned into a temporary but smooth running hospital early in the war into the brand new buildings of the million dollar hospital plant built especially for them by the Army just a few miles from Allied headquarters.

Though the old and new sites are less than ten miles apart, the problem of coordinating the transfer of patients and equipment was highly complicated. The long low type buildings of the new hospital are spread over sixty acres of pasture land on the edge of the city just beyond the end of the streetcar line. Four and one-half miles of covered corridors link the majority of buildings, forming in effect a vast single unit from any part of which patients may be wheeled to any other part without exposure to the weather.

The new hospital plant's architecture is designated by the Army as "subtropical." Built mainly of pressed fiber boards, corrugated fiber sheets and light wood, the buildings have double roofs, wide screened windows, and ventilation ducts at ceiling and floor levels. However, it is really the excellent equipment—not the buildings—of which the hospital staff is proudest.

Capt. Carl D. Clarke, Associate Professor of Art as Applied to Medicine, is attached to the North Africa theater of operations. He has developed a special technic for making prostheses to replace parts of the human body which have been shot away or hopelessly deformed in battle. Captain Clarke was formerly Managing Editor of The Bulletin and is now serving in a similar capacity with a publication recently started in the North African theater.

SPECIAL NOTICE

The Alumni Association is sincerely desirous of keeping in touch with its members through the medium of THE BULLETIN. This is a contact that we want to maintain, especially in these difficult and troublous times. With all alumni busy in the service of their country, and many in the Armed Forces, it is practically impossible for the alumni secretary to keep abreast of the continual changes.

We solicit your individual cooperation in sending information with regard to new enlistments, promotions, changes of address, and other items of general interest. The families and friends of alumni can be of great assistance in forwarding such information to the alumni secretary or by forwarding THE BULLETIN to their loved ones in the service.

ITEMS

Word has been received that Dr. Alfred W. Yocum is returning to the United States after being interned in occupied China since the start of hostilities. Dr. Yocum is a graduate of the Baltimore Medical College, Class of 1912, and has been a medical missionary in charge of a hospital at Pingtu, China.

Dr. Thomas Lloyd Paton, P. & S., Class of 1887, recently celebrated his ninetieth birthday at his home in Paterson, New Jersey, where he has been practicing for fifty-seven years. Known as the state's oldest practicing physician, Dr. Paton has kept abreast of the latest theories and advancements of his profession. He was the first doctor in Passaic County to administer antitoxin in the treatment of diphtheria and he has served the city and state health departments in numerous capacities.

Dr. Paton is a member of the New Jersey State Medical Association, the Passaic County Medical Society, and various fraternal organizations.

Details of the commencement activities and graduation exercises of the December, 1943 graduating class were received too late for publication and will appear in the April, 1944 issue of The Bulletin.

OBITUARIES

COMDR. DeWITT TALMAGE HUNTER

Comdr. DeWitt Talmage Hunter, M.C., U.S.N. (retired), died of heart trouble on October 28, 1943 at the age of fifty-four and was buried in the Arlington National Cemetery.

Commander Hunter, a native of North Carolina, graduated from the School of Medicine of the University of Maryland in 1918 and took post-graduate courses at the Navy Medical School in Washington and the Army Medical School at Carlisle, Pennsylvania. He saw service in the Philippines, China, Europe, Central America, Puerto Rico, and the Virgin Islands, and was attached to recruiting offices in Kansas City, Missouri, Santiago, California, Birmingham, Alabama, and the New York Navy Yard. He was decorated by the Nicaraguan Government for services rendered in that country during the revolution of 1927–29.

A direct descendent of Dr. John Hunter, the English anatomist and surgeon, Commander Hunter was the sixteenth member of his family to receive the degree of doctor in medicine. He was a specialist in tropical medicine and for many years was attached to the Marine Corps.

CAPT. THOMAS LACY MORROW

Capt. Thomas Lacy Morrow, M.C., U.S.N., Class of 1915, died at Guilford College, N. C. on August 11, 1943 at the age of fifty-four, of a cerebral hemorrhage while on leave from his post of duty at the Naval Hospital, Marine Barracks, New River, N. C.

He was appointed assistant surgeon in the U. S. Naval Reserve on April 10, 1917 and a lieutenant (j.g.) in the Medical Corps of the U. S. Navy on June 23, 1917, advancing to the rank of captain in July, 1941. Captain Morrow served aboard the U.S.S. Nero, Eurona, Patoka and Tulsa; served at the Naval Base, Cardiff, Wales with the Destroyer Force and the Atlantic Fleet at the Naval Hospital, and the Pharmacist's Mates' School, Norfolk, the Marine Barracks and Naval Hospital at Parris Island, S. C., the Naval Hospital at Boston, and on the Asiatic Station.

Captain Morrow was a fellow of the American College of Surgeons. He was awarded a letter of commendation for his work as head of the medical relief unit at Belize, British Honduras after the hurricane of 1931, and the medal of distinction by the President of Nicaragua for services rendered in that country from May, 1931 until November, 1932 as brigade surgeon, Second Brigade Marines.

ALBERT A. PARKER, M.D.

Dr. Albert A. Parker, P. & S., Class of 1909, died on August 2, 1943 in Baltimore, where he had been receiving treatment.

Born in Salisbury, Maryland on December 16, 1884, the family moved to Pocomoke while he was a child. He received a degree from the Maryland Agricultural College in 1905 and then started the study of medicine in Baltimore. After graduation Dr. Parker started as a general practitioner in Kent County, but soon returned to Pocomoke where he built a large practice.

Dr. Parker was an active member of the community in which he lived and was held in high esteem as a successful physician and a public-spirited citizen.

Beach, Everett Charles, Oxnard, Calif.; B.M.C., class of 1907; aged 63; died, July 8, 1943, of a brain tumor.

Bell, Clarence John, Wellfleet, Mass.; P. & S., class of 1902; aged 66; died, June 6, 1943, of angina pectoris.

Burgess, Thomas Dickinson, Williamson, W. Va.; class of 1892; aged 73; died, June 24, 1943, of heart disease.

Carey, Charles James, Towson, Md.; P. & S., class of 1897, aged 72; died, June 24, 1943.

Coughlan, J. S., Berkeley Springs, W. Va.; P. & S., class of 1903; died, November 17, 1943.

Fiscus, James Hudson, Greensburg, Pa.; class of 1910; served as captain in the medical corps of the British Army during World War I; aged 58; died, July 4, 1943, of acute myocarditis.

Goldsborough, William Winder, Greensboro, Md.; class of 1901; aged 68; died, July 13, 1943, of carcinoma of the left side of the chest and chronic myocarditis.

Hathcock, Thomas A., Norwood, N. C.; class of 1893; served during World War I; aged 77; died, June 16, 1943, of cerebral hemorrhage and cirrhosis of the liver.

Holroyd, Frederick F., Princeton, W. Va.; P. & S., class of 1910; served during World War I; aged 57; died, August 15, 1943, of coronary thrombosis.

Horger, Eugene Leroy, Columbia, S. C.; class of 1914; aged 54; died, suddenly, October 22, 1943, of coronary thrombosis.

Howell, Thomas P., Davis, Okla.; class of 1872; aged 94; died, July 16, 1943, of bronchopneumonia and an injury received in a fall.

Jenkins, Charles Albert, Willimantic, Conn.; B.M.C., class of 1911; served in France during World War I; aged 55; died, July 24, 1943.

Jennings, Charles Leitner, Jacksonville, Fla.; class of 1906; aged 62; died, September 30, 1943, of bronchogenic carcinoma.

Kurtz, Cyrus, Paterson, N. J.; class of 1902; also a dentist; aged 73; died, July 23, 1943, of cerebral hemorrhage and arteriosclerosis.

McCauley, William H., Sutton, W. Va.; P. & S., class of 1888; aged 83; died, July 2, 1943, of coronary thrombosis.

McDede, Frank Ford, Paterson, N. J.; P. & S., class of 1901; served during World War I; aged 75; died, July 9, 1943, of intestinal obstruction.

Madden, Theophilus Weeks, Collingswood, N. J.; P. & S., class of 1898; aged 67; died, June 29, 1943, of coronary thrombosis and arteriosclerotic heart disease.

Mercier, Albin Scott, Cambridge, Md.; class of 1922; aged 47; died, November 23, 1943.

Murphy, James J., Annapolis. Md.; class of 1896; aged 68; died, June 26, 1943, of diabetes mellitus and carcinoma.

Musser, Parley Pratt, Oakland, Calif.; P. & S., class of 1907; formerly bacteriologist for the city of Oakland; aged 69; died, July 20, 1943, of cerebral thrombosis.

Orem, Frederick Strattner, Baltimore, Md.; class of 1900; aged 70; died, August 8, 1943; of nephritis.

Sellman, John P., Washington, Ind.; P. & S., class of 1896; served as medical examiner for the Baltimore and Ohio Railroad; aged 69; died, August 19, 1943, of uremia, pyelitis, and cystitis.

Sharkey, Myles Bernard, Syracuse, N. Y.; P. & S., class of 1915; aged 53; died, June 21, 1943.

Shellito, Amos G., Independence, Ia.; P. & S., class of 1882; aged 82; died, June 30, 1943, of heart disease.

Smith, E. A., Baltimore, Md.; B.M.C., class of 1891; aged 81; died, November 1, 1943, after a ten month illness.

Steiner, Frederick W., Havre de Grace, Md.; P. & S., class of 1907; died, November 25, 1943, from injuries received in an automobile accident. Dr. Steiner was dean of the Harford County Memorial Hospital.

Stetson, Halbert Greenleaf, Greenfield, Mass.; P. & S., class of 1895; aged 75; died, September 15, 1943, of congestive heart disease.

Williamson, Stephen W., Dovesville, S. C.; P. & S., class of 1904; aged 72; died, July 14, 1943, of myocarditis and cerebral thrombosis.

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ETIOLOGY AND TREATMENT OF PERSISTENT SUBSCAPULAR OR APICAL SPACE INFECTIONS COMPLICATING THORACOPLASTY*†

WITH CASE REPORTS

O. C. BRANTIGAN, B.S., M.D.

BALTIMORE, MD.

When the chest wall is collapsed in the modern type of thoracoplasty, the bony thoracic cage is changed and this creates a space between the scapula and the regenerated bony thoracic wall. Should this space become infected, the infection is usually persistent.

Normally an imperfect bony triangle is formed by the scapula posteriorly, the clavicle anteriorly, and the upper ribs medially (Fig. 1A). The area between these bones is filled with muscle and a free space does not exist. Two sides, the clavicle and the scapula of this bony triangle are movable, but their lengths cannot change even though their angle, the acromioclavicular joint, can. The third side, the rib or medial side of the triangle, is immovable or fixed. A thoracoplasty changes the medial or rib side of the imperfect triangle, thus creating a greater distance from the acromioclavicular angle or joint to the ribs (Fig. 1B). Even though the other two sides of the triangle are movable and can compensate in some degree for the increased distance from the acromioclavicular joint to the rib, this increased distance cannot be overcome completely and thus a free space is created (Fig. 1B and 2). If five ribs or less are resected the space is larger because the lower end of the scapula rests against the unresected ribs and prevents the movable sides of the triangle from conforming at all to the changed medial side. The space

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* From the Department of Surgery, School of Medicine, University of Maryland and Mt. Wilson Sanatorium.

† Received for publication February 5, 1944.

remains because bony supports prevent falling in of the soft tissues and the collapse of its walls.

When a subscapular or apical space infection occurs it persists, as do space infections elsewhere in surgery. Routine drainage of thoracoplasty wounds, unnecessary operative trauma, and the Semb's (8) apicolysis by creating a larger space contribute to the incidence of infection. The infections most often found are mixed tuberculous and pyogenic. Improvement in surgical technic (9), skin preparation, the covering of skin edges, excision of scars, reduction of operative trauma, mechanical retraction of the scapula (2), effective hemostasis, elimination of all drains (5), and careful wound closure have greatly reduced the number of subscapular infections.

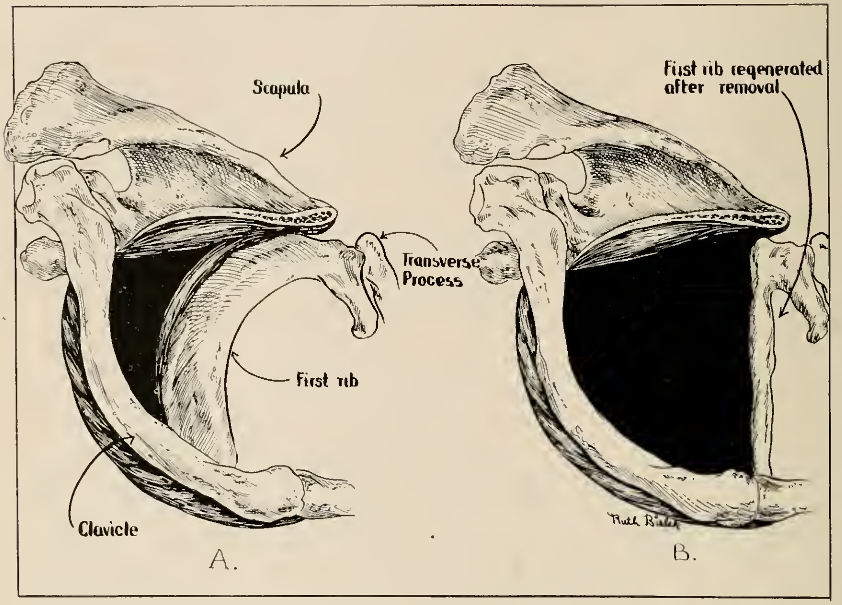

Fig. 1A. A drawing of the imperfect bony triangle formed by the scapula, clavicle, and ribs. The ribs are fixed but the clavicle and scapula can move and conform somewhat to the ribs. The black area is shown as a space, but normally no free space exists because it is filled with muscles of the shoulder girdle.

Fig. 1B. In this illustration is shown the change in the bony triangle when the upper ribs are resected and regenerated, as in the modern routine thoracoplasty. The movable scapula and clavicle can conform slightly to the new position of the resected ribs but not enough to prevent a true free space from being present. This is particularly true after a Semb's apicolysis and also when only the upper two to five ribs are resected. In the latter case the lower end of the scapula rests on the unresected ribs and prevents the partial obliteration of the space by the scapula.

In the past several types of treatment were used for this condition. The nonoperative treatment consisted of prolonged irrigation and chemical sterilization of the sinus tract. If no free space existed this method usually sufficed. Operative treatment was adequate drainage (11), with or without maggot therapy or excision of the infected space and sinus tract. Often much time was thus consumed and the end result was a persistent draining sinus.

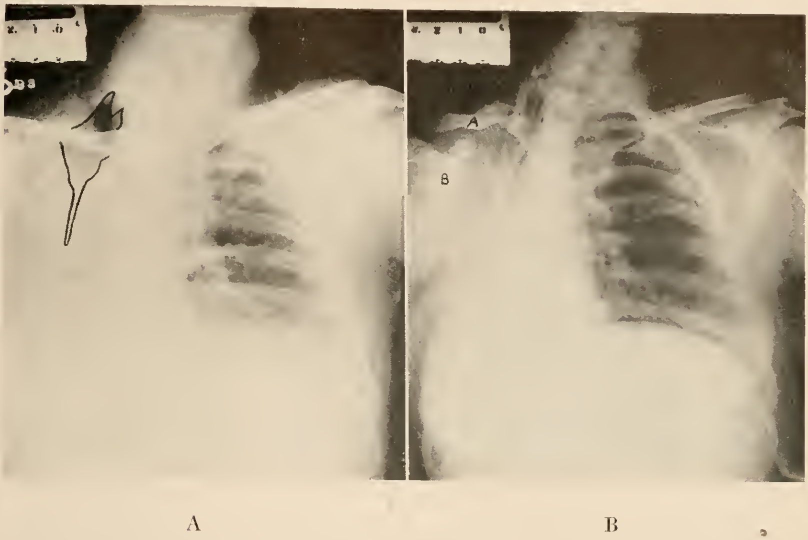

FIG. 2A. Roentgenogram of the chest of the patient in Case No. 4 taken before an attempt was made to obliterate the subscapular or apical space which is shown so well. The outline indicates the subscapular or apical space present after a two stage thoracoplasty.

FIG. 2B. A chest roentgenogram of the same case after resection of the scapula and clavicle. The air-containing subscapular space is no longer present. A, The clavicle is united firmly. B, The unit of the three processes, acromion, coracoid, and glenoid cavity, is well shown but must be carefully distinguished from the head of the humerus. The distance of the head of the humerus from the vertebral column as compared with the opposite side also can be seen.

Adams (1) in 1910 used the scapula to occupy the space left by the excised ribs in a successful attempt to obliterate an empyema cavity. In doing a thoracoplasty Leahy (4) transplanted the lower scapula into the thoracic cage after resection of three and a half ribs posteriorly. Holman (3) practiced partial resection of the scapula at the time of thoracoplasty for its benefit in compressing the apical tuberculous abscesses. The usual subscapular space is thus filled with the small partially resected scapula. Steinke and Villani (10) have resected the medial portion of the scapula for the relief of pain. Wakeley (12) and Ryerson (7) completely excised the scapula for

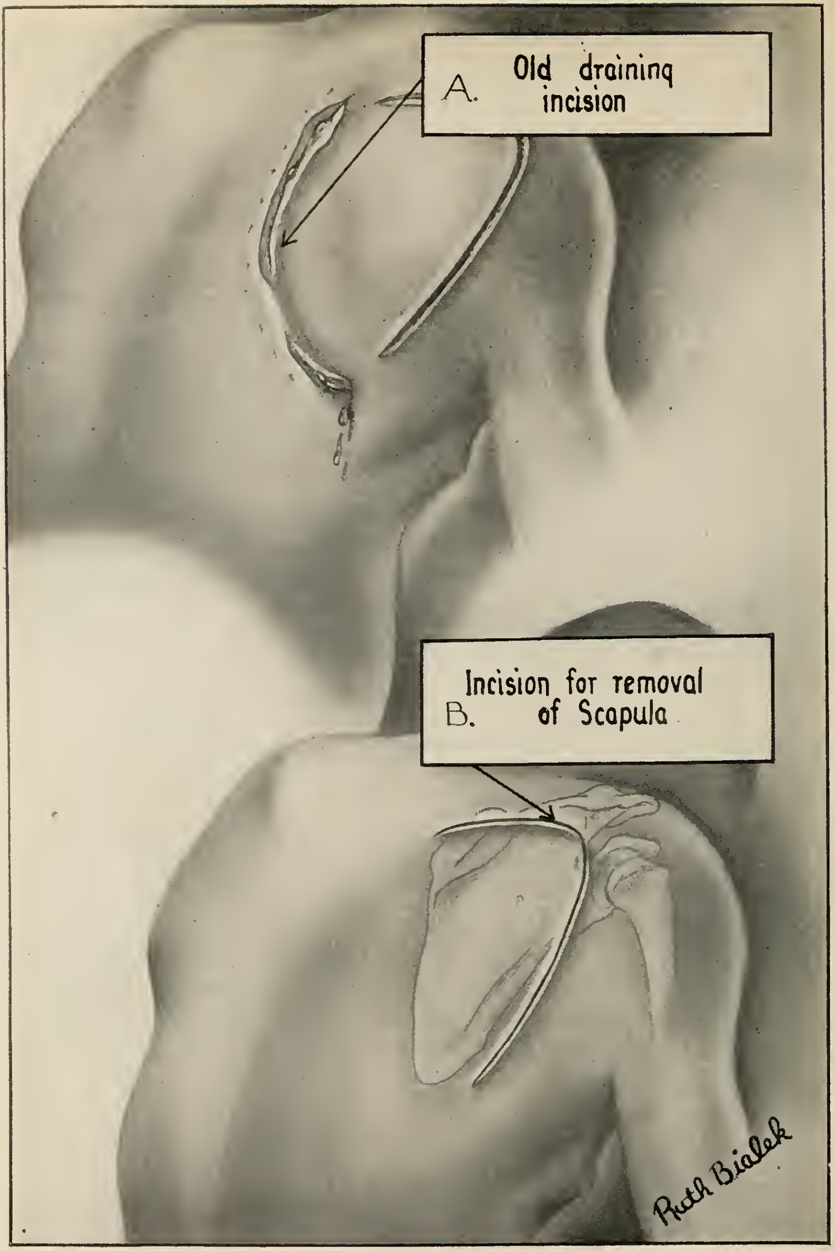

FIG. 3A. The usual sites where the draining wound or sinuses are located after a thoracoplasty. The incision used for resection of the scapula also is indicated. This particular incision must be adopted in order to avoid the infected draining area.

FIG. 3B. The incision used for resecting the scapula. It illustrates the relation of the incision to underlying skeletal structures.

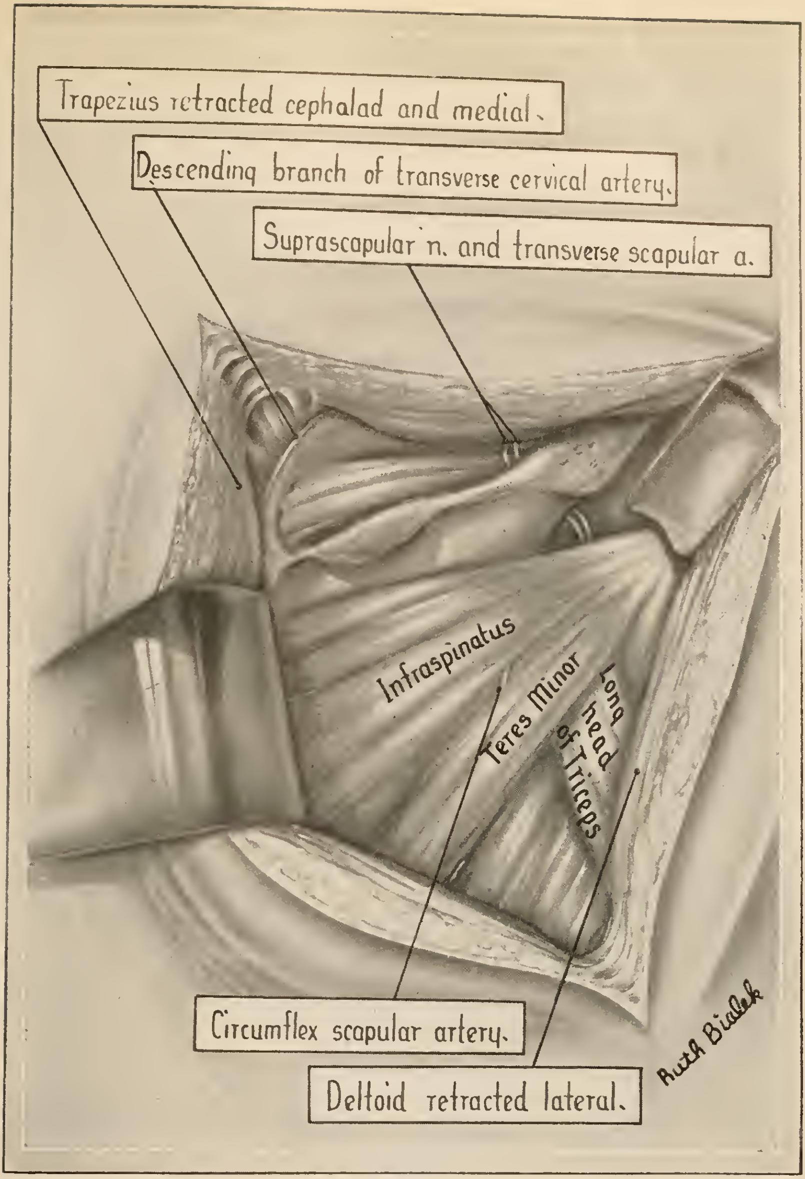
Trapezius retracted cephalad and medial.
Descending branch of transverse cervical artery.
Suprascapular n. and transverse scapular a.
Infraspinatus
Teres Minor
Long head of Triceps
Circumflex scapular artery.
Deltoid retracted lateral.
Ruth Bialek

FIG. 4. A step in the operation for resection of the scapula. The skin and subcutaneous tissue have been dissected free and retracted as a single flap. The trapezius and deltoid muscles have been freed from the spine of the scapula, thus exposing the superficial scapular muscles. The transverse scapula, the circumflex scapular artery, and the descending branch of the transverse cervical artery are exposed as illustrated and then doubly ligated and divided. This will control the major blood supply. The exposed scapular muscles are divided about two inches from the vertebral border of the scapula. They are freed from the scapula with scissors, taking care not to remove the easily stripped periosteum. The dissection is carried around the vertebral border of the scapula and then the subscapular muscle is removed from the scapula. With the bone thus freed it is cut across with forceps, leaving intact the unit of three processes, the acromion, coracoid, and glenoid cavity.

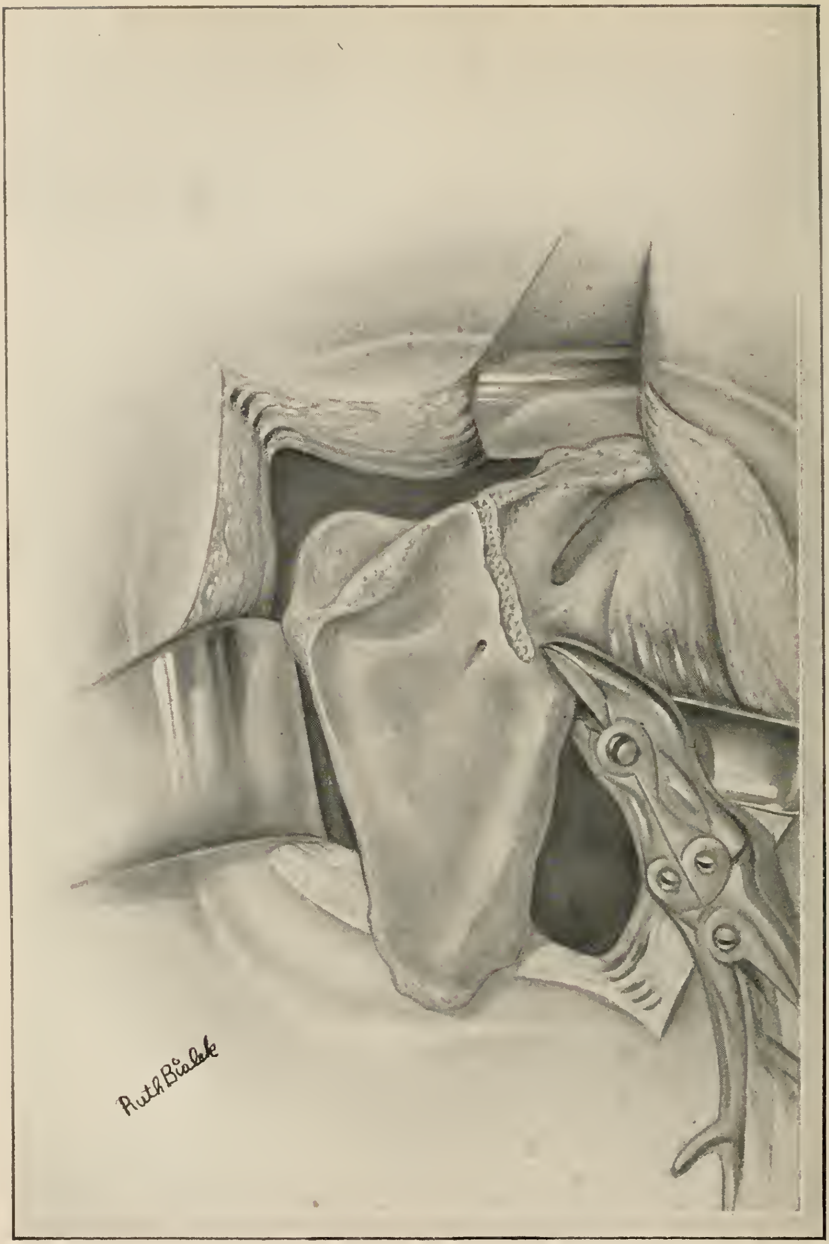

Fig. 5. The site at which the scapula is resected, leaving the unit of three processes, acromion, clavicle, and glenoid cavity, intact and attached to each other. The scapula is removed extraperiosteally to prevent regeneration.

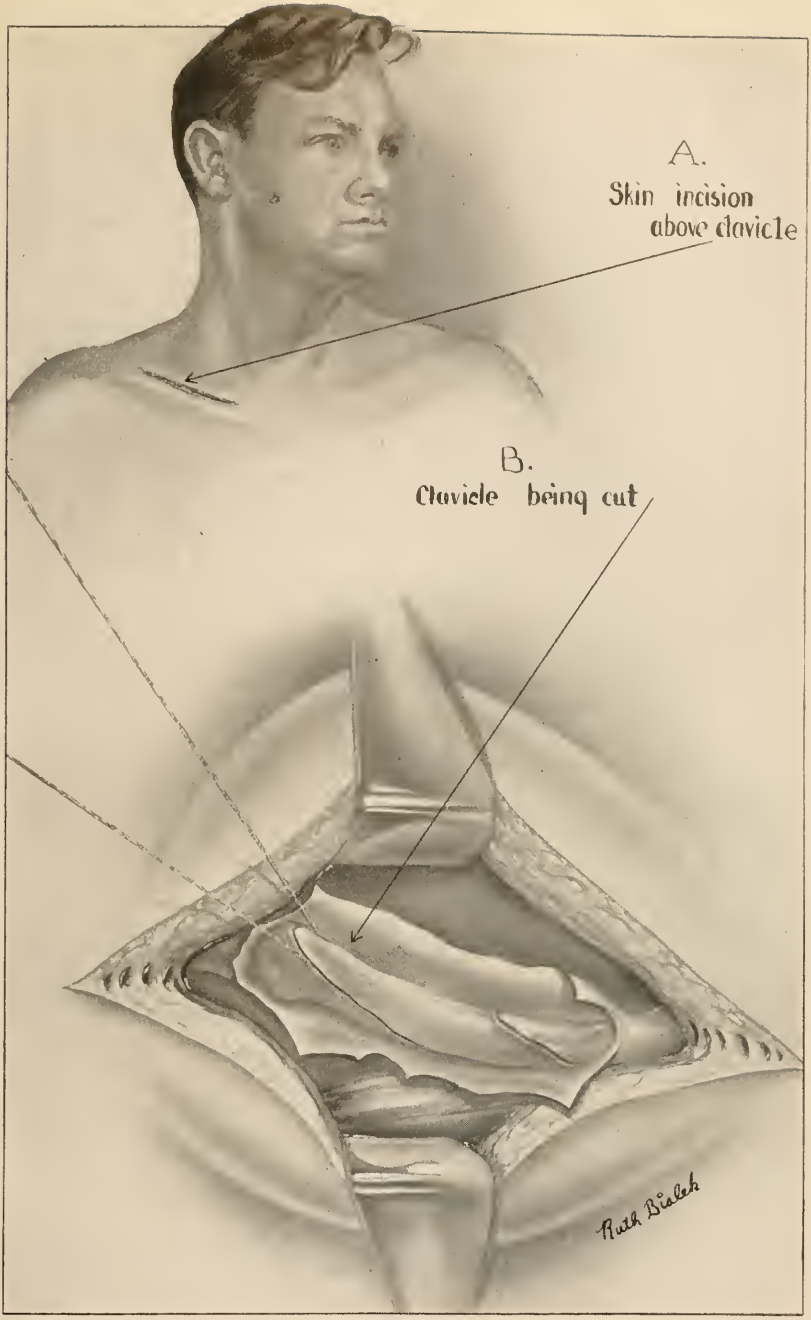

FIG. 6A. The site of the skin incision for resection of the clavicle.

FIG. 6B. These lines illustrate the oblique subperiosteal resection of the clavicle. The oblique resection is done in order to permit easier apposition and holding of the resected ends of the clavicle. The resection is made with a Gigli saw.

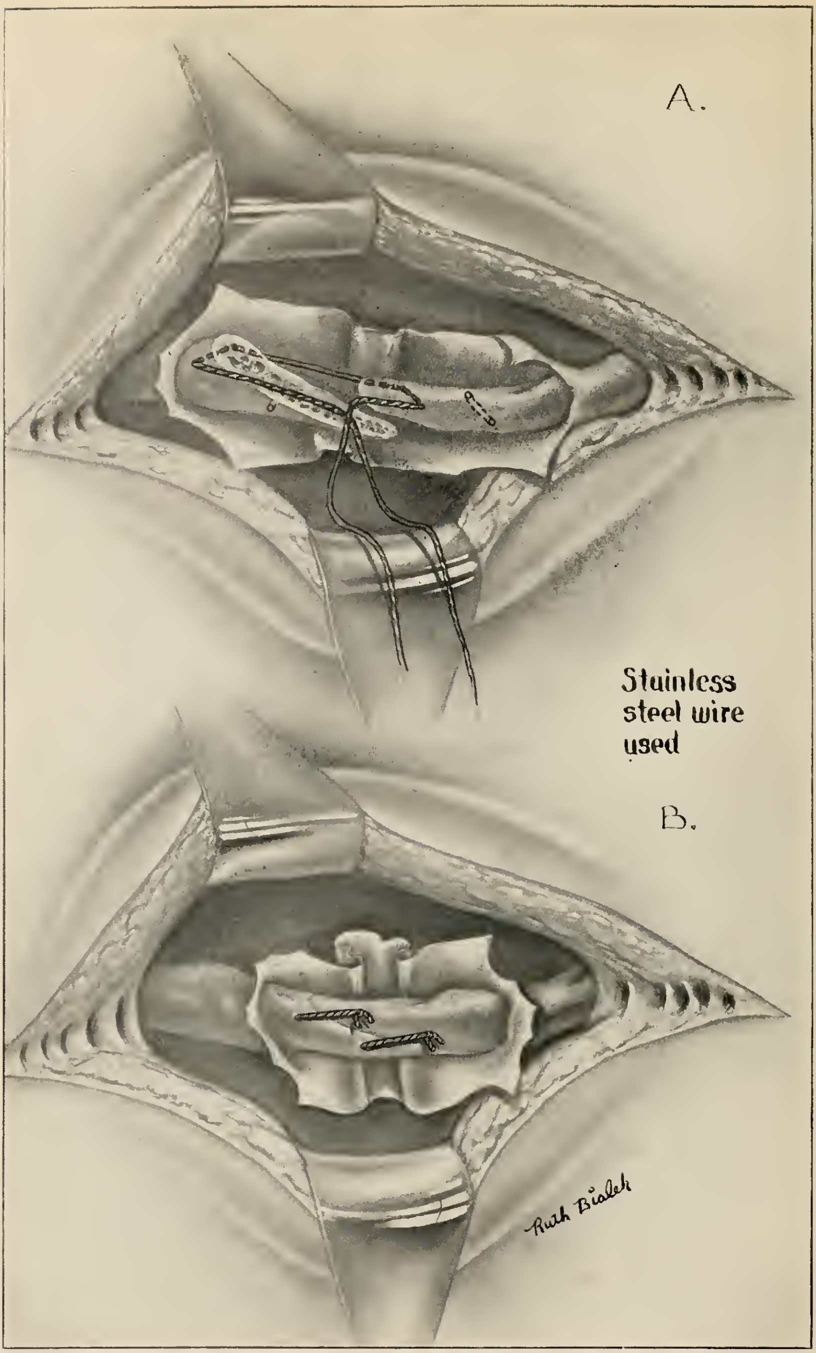

Fig. 7A. The clavicle is shown resected obliquely with two holes drilled through each end. One set of holes is threaded with a fine stainless steel wire.

Fig. 7B. The obliquely resected clavicle is reunited and held firmly in position by two stainless steel wire sutures. The undisturbed periosteum is imbricated and closed over the bone. Following this operation the arm is held to the side of the body by bandages for three weeks.

malignancy and had good functional results. Pieri (6) has resected the middle portion of the clavicle as a complement to the Sauerbruch thoracoplasty. He demonstrated the change in the bony triangle but advised it in order to relax muscular pull upon the resected ribs.

With an understanding of the true pathologic conditions and with a knowledge of the various operative procedures used on the scapula and clavicle, an attack was directed against the bony walls of the subscapular space. It was found that the space could be partially obliterated by removing a portion of the scapula or by resecting additional ribs. In either case the scapula and its surrounding muscles fell into the space and if the subscapular space were not too extensive it would bring about a favorable result. Unless a greater pulmonary collapse was needed the resection of more ribs sacrificed good lung tissue. There was also the disadvantage of operating in an infected field, which resulted in an infected postoperative wound.

Accordingly, a new attack in two stages was directed against the bony walls of the space through a noninfected field. At the first operation (Fig. 3, 4, and 5) under general anesthesia, approximately 90 per cent of the scapula was resected extraperiosteally since regeneration was undesirable. The unit of three processes (Fig. 5), the acromion, coracoid, and glenoid cavity, of the scapula was carefully left intact in order to preserve as much as possible of the shoulder and arm motion. About three weeks after the first operation the second (Fig. 6 and 7) was performed under local anesthesia and consisted of subperiosteal resection of one and one-half to three inches of the medial third of the clavicle. In this manner the posterior bony wall of the space was removed and the anterior bony wall shortened. The muscular mass formerly present about the scapula fell into the subscapular space and molded itself about the irregularly regenerated rib bed, thus obliterating any regular or irregular space. With the space obliterated complete healing occurred without having entered the infected field.

This operative procedure was carried out on four patients. A brief history of each follows.

CASE REPORTS

Case No. 1: E. P. H. was a white male, age 20. On April 1, 1941 a first stage thoracoplasty was performed, removing the first three ribs on the left and doing a Semb apicolysis. Subsequently there developed a pure tuberculous infection in the apical space. On two occasions drainage of the space was instituted, with little improvement. Additional rib resections were done which controlled the pulmonary disease but not the infection of the apical space. On December 14, 1941, under local anesthesia, two inches of the left clavicle were resected. Considerable improvement followed but there remained a residual space which was infected. On July 17, 1942 the scapula was resected and the three processes, that is, the acromion, coracoid and glenoid cavity, were left intact. During this course of treatment the patient developed a tuberculous infection of the right knee joint. An arthrodesis was done. The apical region continued to drain but an examination revealed no free space. On April 23, 1943 an operative exploration of the sinus tract was made and rather extensive tuberculous infection of the regenerated ribs was encountered. The diseased bone was removed. It now appears that the region is about to heal completely. The patient has the normal use of the hand, forearm, and arm, but practically none of the motion that formerly belonged to the scapula and shoulder girdle muscles. In view of the extensive and destructive infection about the shoulder region one would not expect the shoulder girdle muscles to function.

Case No. 2: M. B. H. was a white woman, 25 years old, on whom a right extrapleural pneumothorax was performed on October 1, 1940. The extrapleural space became infected and drained externally. On June 10, 1941 a first stage thoracoplasty was done, with a posterior resection of the first to fourth ribs inclusively on the right. The whole wound broke down from infection and drained profusely. In order to establish better drainage an anterolateral resection of the second to fourth ribs inclusively was done on July 29, 1941. The patient's condition was grave and it was apparent she would not recover without additional aid. On January 25, 1942, using a general anesthetic, the right scapula was resected extraperiosteally and the three processes were left intact. On February 6, 1942, under local anesthesia, two inches of the right clavicle were resected subperiosteally. Drainage of the subscapular space was reduced considerably and the patient improved. On March 13, 1942, the fifth, sixth, and seventh ribs were resected posteriorly. The resected ribs showed definite bone infection. Since the scapula had previously been removed it was possible to make the incision directly over the ribs to be resected, thus exposing only a small area and eliminating the fear of postoperative infection. On February 24, 1942 the anterior ends of the fifth, sixth, and seventh ribs were resected and found to be the site of the bone infection. The general condition of the patient improved and she gained weight. The results of the sputum examinations became negative. All the wounds healed except one sinus, which seemed to be the result of an infected bone. On March 10, 1943 an examination of the sputum was found to be positive as the result of a new tuberculous lesion in the opposite lung. At the present time the motions of the hand, forearm, and arm are almost normal but scapular motion is practically absent because of the tissues destroyed by infection before scapular resection.

Case No. 3: R. V. McC. was a white male, age 23. A two stage right-sided thoracoplasty was completed on January 10, 1939. The wound became infected and continued to drain. Tubercle bacilli were recovered from the drainage. On April 3, 1942, under general anesthesia, the right scapula was resected extraperiosteally and the three processes were left intact. On April 17, 1942, with local anesthesia, about two inches of the right clavicle were resected subperiosteally. The posterior fistulous tract closed rather promptly. On September 11, 1942 a portion of the old broad unsightly thoracoplasty scar was excised. It healed by primary union. The patient was advised not to use his shoulder muscles for the first six postoperative months. He now has practically normal power and motion in the right upper extremity, except for elevation of the arm over his head. The extent of motion is indicated by the photographs seen in Figures 13, 14, and 15.

Case No. 4: M. D., a white woman, 30 years old, was known to have diabetes mellitus in 1934. On May 2, 1940 a left two stage thoracoplasty was completed. The wound became infected. It resisted all treatment and showed no signs of healing. After two years the wound was almost as extensive as the original thoracoplasty incision and deep enough to admit the examiner's fist (Fig. 2). The wound drained profusely and required dressings more than once daily. There was a demonstrable bronchopleurocutaneous fistula at the lower end of the wound. The patient had a small cavity in the contralateral lung and an examination of the sputum proved to be positive for tubercle bacilli. In spite of all these findings she maintained her weight. On April 24, 1942, under general anesthesia, the left scapula was resected extraperiosteally and the three processes were left intact. On May 22, 1942, under local anesthesia, about two inches of the left clavicle were resected subperiosteally. On July 24, 1942 the posterior ends of the seventh and eighth ribs were resected. Following these operative procedures the posterior draining wound healed and the bronchopleurocutaneous fistula closed. However, at present this

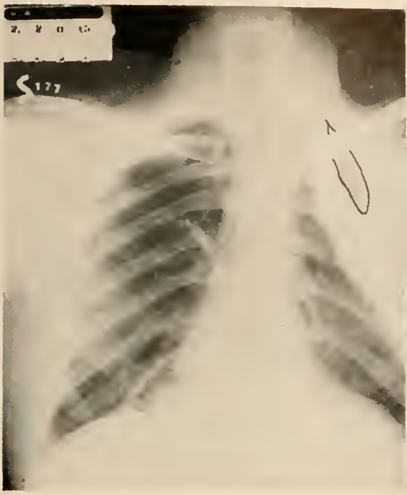

FIG. 8

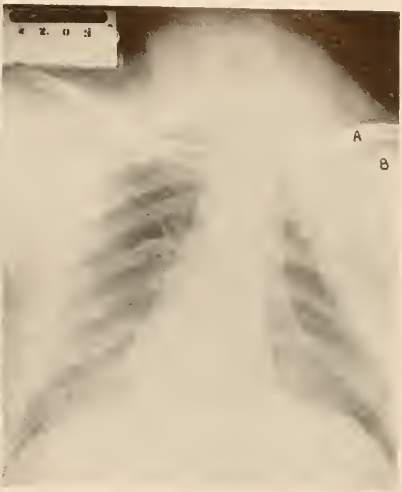

FIG. 9

FIG. 8. A roentgenogram of the chest of the patient in Case No. 3. The outline illustrates well the subscapular or apical space. This space was infected by tubercle bacilli. The external draining sinus prevented the space from filling with fluid.

FIG. 9. The chest roentgenogram of the patient in Case No. 3 after resection of the scapula and clavicle. A, The solid union of clavicle can be noted. B, The coracoid process of the resected scapula is shown. The decrease in distance from the coracoid process to the regenerated ribs is easily seen.

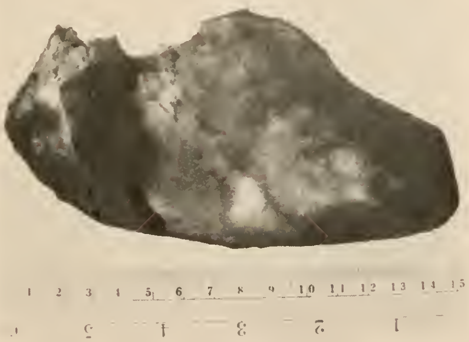

FIG. 10. The resected portion of the scapula from the patient in Case No. 2.

fistula is open again at the upper end of the old thoracoplasty incision, but it is now only a sinus tract and there is little drainage. The cavity in the contralateral lung has become larger, yet the patient generally seems no worse. The function of the upper extremity is much the same as in Cases No. 1 and 2. In spite of the disease in the contralateral lung and the bronchopleurocutaneous fistula she has been made comfortable.

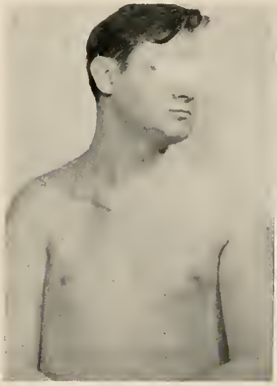

Fig. 11

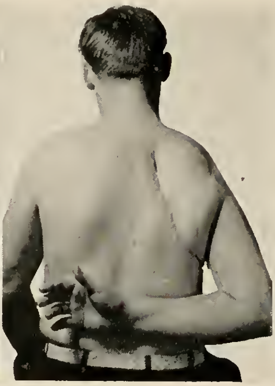

Fig. 12

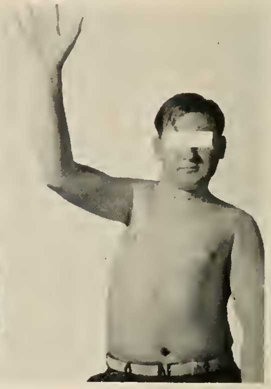

Fig. 13

Fig. 11. A photograph of the patient represented in Case No. 3 which shows the deformity of the right shoulder. The shortened right shoulder should be compared with the normal left one.

Fig. 12. The patient demonstrates his ability to place the arm behind his back. The old thoracoplasty scar as well as the scar resulting from the scapular resection are shown clearly.

Fig. 13. A photograph showing the ability and extent to which the patient can elevate his arm over the head.

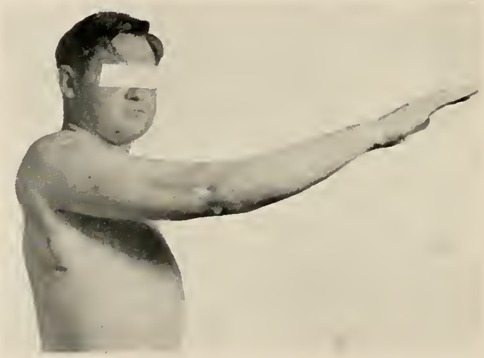

Fig. 14. The same patient with his arm extended in front of the body.

Of the four patients treated by scapular and clavicular resections the lives of two have been saved by eliminating infection and making possible additional rib resections. For one patient it has changed an almost intolerable existence to one of comfort. In another patient it eliminated a draining sinus and a focus of infection at the cost of some impairment of shoulder function. The infected area was not entered into in any of the four patients. The clavicle united promptly in every instance.

When badly infected posterior thoracoplasty incisions exist, when infected extrapleural pneumothorax spaces occur, or when apical Schede operations are necessary, the preliminary removal of the scapula will allow additional rib resections without necessitating a large incision. Even though the incision for removal of additional ribs must be made through infected tissue, healing is impeded for only a minimal time since the wound is small and no free space exists after operation.

It is important to leave intact the unit of three scapular processes in order to preserve shoulder and arm motion. The extent of tissue destroyed by infection previous to scapular resection will greatly influence the impairment of shoulder function. Under ideal circumstances the impairment of shoulder function will occur. In order to give the apical space infection every opportunity to heal, shoulder motion should be restricted after resection of the scapula and clavicle. Use of the arm, forearm, and hand should be encouraged in order to maintain their normal strength and function.

CONCLUSION

Subscapular or apical space infections are persistent because of a free space whose walls are prevented from collapsing by bony supports. These space infections can be eradicated by collapsing the bony supports of the free space.

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TRAUMATIC RUPTURE OF A VEIN IN THE TRANSVERSE MESOCOLON*†

REPORT OF A CASE

LIEUT. JOHN R. HERMAN, M.C., U.S.N.R.

The traumatic rupture of intra-abdominal blood vessels is not a rarity. Spicer (1) mentions many cases, and the modern literature contains numerous reports of this type of accident. Traumatic rupture of a vein in the mesocolon without associated injuries is apparently rare. No similar case report could be found. In a comprehensive review Cushman and Kilgore (2) described a syndrome of mesenteric hemorrhage without associated trauma as seen in twenty-two cases of ruptured arteries. The syndrome they presented consisted of dull, sickening recurrent pain, great restlessness, and the urgent desire to vomit and to have bowel movements. This last desire remained unsatisfied after frequent vomiting or defecation. Rupture of the leaf of the mesentery encapsulating the hematoma usually causes sudden excruciating exacerbation of pain and rapid collapse.

The case reported here is an interesting and rare instance of traumatic rupture of a vein in the transverse mesocolon, with formation of a large cystic hematoma and subsequent rupture of that hematoma into the lesser peritoneal sac. Further spread into the greater peritoneal sac was followed by death from exsanguination. The symptoms as seen in this patient closely parallel Cushman and Kilgore's syndrome, although the traumatic origin cannot be doubted in this case.

CASE REPORT

Present illness: R. H. was a 33 year old Indian male who, after a few drinks, ran his automobile into a locomotive. He was unconscious and bleeding from both nostrils when taken to another hospital. While there he recovered consciousness and is said to have vomited "coffee ground" material. After several hours of observation he was sent home because of a lack of beds. The patient's wife was told that he had a head injury. At home he continued to vomit frequently, complained of severe lower abdominal pain and of occasional sharp substernal pain. He was said to have been irrational, cold, pale, and clammy, and was admitted to Sinai Hospital sixteen hours after the accident.

Physical examination: The patient was a well developed, rational male who appeared seriously ill. His temperature was 101 F., the pulse rate was 120, and the rate of respiration was 40 per minute; the blood pressure was 110 mm. of mercury systolic and 84 mm.

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* From the Surgical and Laboratory Services of Sinai Hospital, Baltimore, Md.

The opinions and assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

† Received for publication December 15, 1943.

diastolic. He was pale and apprehensive and twisted and tossed on his bed, but seemed fairly comfortable when resting on his side with both legs flexed upon his abdomen. His respirations were shallow. rapid, and irregular. There was a small abrasion in the occipital region; blood crusts were present in both nostrils. The breath sounds were distant over the base of the right lung posteriorly. On respiration the abdomen was flat and fixed. The percussion note was tympanitic around the umbilicus and dull in the flanks. The entire abdomen was extremely tender, and the upper abdomen was splinted. No abnormal masses or organs could be felt The neurologic examination showed doubtfully absent knee jerks and a bilaterally positive Babinski reflex.

Laboratory findings: Chemical examination of the blood on admission showed red blood corpuscles 4,600,000; white blood corpuscles 16,000; hemoglobin 12 grams. The carbon dioxide combining power was 34.7 volumes %. Determinations of urea, chlorides, sugar, and urine were all essentially normal. The stool was negative for occult blood and remained so throughout his stay in the hospital.

Course in hospital: The impressions on admission were: ruptured abdominal viscus with hemoperitoneum, fractured skull, subdural hematoma, alcoholic gastritis, and rectus sheath hemorrhage. A course of watchful waiting was followed.

For the first day or so the patient continued restless and nauseated. He frequently caused vomiting by inserting a finger into his throat. The vomitus consisted of greenish-yellow gastric content which was negative for occult blood. The patient was thirsty but unable to retain fluids. He was given 3000 cc. of 5 % glucose intravenously in the first twenty-four hours. His red blood cell count dropped to 3,200,000. A lumbar puncture on the first day revealed entirely normal spinal fluid under normal pressure.

He continued to complain of sharp aching abdominal pains which were most severe in the right lumbar region. His abdomen was rigid and rather tender, especially in the epigastrium. Roentgen ray examinations of the skull, the genito-urinary tract, and the abdomen were negative, but a roentgenogram of the chest revealed a slight haziness at the base of the left lung.

By the fourth day the patient was quiet and his general condition appeared improved. The carbon dioxide combining power was normal, but on this date a 4 plus urobilin was found in the urine.

On the fifth day a fulness was observed in the epigastrium and a boggy nontender bulging area was found in the rectal cul-de-sac. An impression of hemoperitoneum and a pseudocyst of the lesser peritoneal sac was made at this time. The abdominal mass continued to grow and was thought to be approximately 13 cm. in diameter, with its upper margin 3 cm. below the xiphoid process and extending laterally to the margins of the rectus sheath. The corrected blood sedimentation rate, previously normal, was 26 on the sixth day.

On the seventh hospital day the patient again became extremely ill and jaundice was first noted. An icteric index of 20 on the sixth day had risen to 40 by the ninth day and had fallen back to 20 two days later. On the ninth hospital day a barium enema proved unsatisfactory because the patient was unable to retain the fluid. Two days later a barium meal revealed the stomach displaced to the right and a large filling defect on the greater curvature. This was thought to be the result of pressure by a mass from without. The small intestine was displaced downward and to the right, and the splenic flexure was also pushed downward.

Despite blood transfusions and full supportive therapy the patient's condition became progressively worse and, on the fourteenth day after admission, he suddenly went into deep shock and died. An exploratory laparotomy was to have been performed the following day.

Postmortem examination (by Dr. Tobias Weinberg): The abdomen was found to be definitely and symmetrically distended, with bulging in the flanks. There was approximately 3000 cc. of free bloody fluid in the greater peritoneal sac, besides many large blood clots about adherent loops of the small intestine and in the lesser pelvis. The stomach was distended and pushed downward. . The transverse colon presented prominently in its middle third, and a large mass was palpable between the colon and the pancreas. The major portion of the greater omentum was adherent to the splenic flexure of the colon and the parietal peritoneum.

The lesser sac formed a huge cavity which was bounded above by the stomach and liver and below by the transverse colon. There was approximately 2500 cc. of bloody fluid in this sac, in addition to many large blood clots and much organizing sanguino-fibrinous exudate. The main mesenteric vessels were found to be intact, but upon further dissection of the fixed specimen a torn vein was found in the posterior leaf of the transverse mesocolon (Fig. 1). This vein was apparently a branch of the middle colic vein. No other vascular or visceral injury was found.

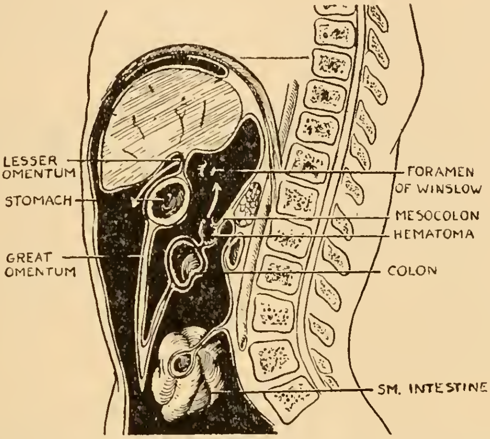

Fig. 1. Section through the abdominal cavity to show the greater and lesser peritoneal sacs and the site of the ruptured vessel.

SUMMARY

A rare case of traumatic rupture of a small vein in the transverse mesocolon with hemorrhagic cyst formation and terminal exsanguination into the peritoneal cavity is presented. The symptoms closely parallel those described by Cushman and Kilgore. The findings at the postmortem examination are described and are thought to have cast further light on this type of accident. Decisions as to procedure and treatment must be based on the merits of the individual case.

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ELEMENTS OF PRE- AND POSTOPERATIVE CARE FOR THE HOUSE OFFICER

C. MARTIN RHODE, M.D.*†

> "*Surgery has been made safe for the patient; we must now make the patient safe for surgery.*"—LORD MOYNIHAN.

INTRODUCTION

Pre- and postoperative care necessitate a knowledge of normal human physiology and an earnest attempt of the surgeon to recognize deviations from it, restoring them to normal or as near normal as the situation or time permits. This branch of surgery often does not receive necessary attention probably because of its insidious nature and the inability to obtain striking or dramatic therapeutic results.

It is not the intention of this paper to expound or even mention all of the aspects of the preparation and after-care of surgical patients but the more important points that have not been brought to the attention of house officers, since it is mainly for them that this is written.

Water, electrolyte balance, nutrition, and care of the liver will primarily receive consideration. Along with these suggestions on practical applications will be made.

The discussion will pertain mainly to patients who are candidates for major surgical procedures.

WATER AND ELECTROLYTE BALANCE

Base line clinical pathologic data, that is, tests made immediately upon admission, usually serve as an index to the amount of treatment necessary and should be used only for comparison; they should not be interpreted as true values. Dehydration must be corrected in order to accurately assay the blood chemistry and hematologic studies, for often the total protein and hematocrit determinations are within normal limits, with hemoconcentration in an anemic and hypoproteinemic patient. Without resorting to complicated blood volume studies, adequate hydration may be said to be present if the urinary output is at least 1000 cc., with a specific gravity of 1.015 or more.

The minimum laboratory findings should include: the percentage of hemoglobin, hematocrit, total protein determination, chloride levels, car-

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bon dioxide combining power, nonprotein nitrogen level, routine urinalysis, and acceptable liver function tests.

In combating dehydration, fluid by mouth is the best mode of administration, if tolerated. Amounts as large as 5000 to 8000 cc. should be given only with salt by mouth because with dehydration there is usually a concomitant upset in the electrolyte balance. It is important to remember that intravascular and interstitial water contain a steady concentration of salt which cannot vary except within narrow limits. This concentration is equivalent to 0.9 per cent sodium chloride, the usual physiologic saline solution.

According to Smith, the kidney is concerned with the maintenance of a constant composition of the various chemical components of the blood and, secondarily, with a constant blood volume (41). For instance, if too much salt is ingested by the organism, the normally functioning kidney promptly excretes the excess. If the body fluids contain too much acid or alkali, the kidney aids in restoring the balance by forming alkaline or acid urine as needed. It is indeed fortunate that the kidney exerts this balancing effect on the electrolyte balance for usually the oral administration of adequate sodium chloride alone will suffice to restore the acid base equilibrium.

The minimum daily intake of salt should be about five grams, yet excessive amounts cause edema in a patient with low circulating proteins.

In some cases when oral fluids cause vomiting, the instillation of a stomach tube with a slow continuous drip will be tolerated. Also, merely washing out the stomach with saline or 5 per cent sodium bicarbonate solution sometimes causes a cessation of vomiting; this is particularly true of diabetics. If vomiting then continues, parenteral clysis is the route of fluid and electrolyte administration.

A sufficient quantity must be given carefully, for edema is likely to occur with the coexisting hypoproteinemia. Continuous intravenous infusion at the rate of 40 drops per minute is accepted to be safe, except in the presence of cardiac difficulty. Subcutaneous infusions into the thigh of physiologic saline alone or combined with 2½ or 5 per cent glucose are often used. The accompanying discomfort can be reduced by the addition of one-half ounce of one per cent procaine solution to each 500 cc. of infusion fluid. The intramuscular route is also used. With this method the infusion is more quickly absorbed and the pain factor is minimized.

The site of continuous subcutaneous or intramuscular injections should be changed at least once in thirty-six hours to prevent inflammation or infection. Unexplained fever has resulted from prolonged infusions because local symptoms may not appear until the third or fourth day.

Almost every patient undergoing a surgical operation needs 3000 cc. of fluid each day, this amount being lost by sweating, insensible perspiration, urine, stool, and water vapor lost with respiration. Whenever vomiting, diarrhea or intestinal fistulas are present the volume thus lost must be replaced in addition to the basic 3000 cc. For all practical purposes the fluid lost from the bowel is protein-free plasma and consequently should be restored by Ringer's solution or 0.9 per cent saline (15, 16). When large volumes of parenteral fluids are given to a patient with low plasma proteins it is often advisable to use 1000 to 2000 cc. plasma in the total 5000 to 8000 cc.

Infusion of this size should be predominantly 5 per cent glucose in distilled water for its nutritive value and because saline will cause edema and transudation into the bowel lumen in the presence of hypoproteinemia. This transudation helps further to initiate vomiting, with a resultant loss of more intestinal juice.

Anemia is most efficiently and quickly treated with whole blood transfusions, iron and liver therapy usually being too slow. Cooksey (17) advocates large transfusions, from 3000 to 4000 cc., over a period of twenty-four hours, and finds this method better than the older stimulating volume of 250 cc. in interrupted doses. Whole blood, of course, simultaneously raises the plasma protein level.

NUTRITION, LIVER AND PROTEIN REPAIR

The liver is a large organ with amazing reproductive power and reserve; because of this a major liver insufficiency often exists without clinical signs. As a rule, the modern liver function tests are sufficiently sensitive to reveal this impairment. These function tests are based on the different mechanisms of the liver. Frequently the damage will cause inefficiency in only one or two of these biologic mechanisms, the remainder being normal. It is therefore advisable to perform several of these tests in order to ascertain the presence of injury. One normal liver function test does not indicate a normal organ.

The tests used at this hospital are: icteric index, van den Bergh, bromsulphalein, prothrombin time, prothrombin test, intravenous hippuric acid, and cephalin flocculation test. Mateer and Steigmann (33, 42) evaluate these tests in detail according to their relative sensitivity.

Tests made on patients with gastric ulcer, diarrhea, alcoholism or like conditions will undoubtedly show abnormal function because poor nutrition is one of the most frequent causes of liver insufficiency in spite of no gross symptoms of liver impairment.

Previously it was thought that glucose was the food par excellence for building up the damaged or preoperative liver. It since has been definitely proved, however, that its main benefit lies in sparing the liver protein, which is probably the most necessary constituent for normal functioning.

Pathologic examination of the damaged liver often reveals fatty infiltration occupying the space normally taken up by the glycogen and protein. Even when this is not seen microscopically, chemical analysis shows increased fatty acid content. Pathologically, scarring and necrosis also may be seen.

Ravdin (38) found that a diet consisting of 70 to 75 per cent of carbohydrate, 20 to 25 per cent protein, and 5 to 10 per cent fat when fed to experimental animals afforded the greatest resistance to liver toxins and caused most rapid repair. In humans he advocated this ratio with a caloric value of at least 3000 per day. This diet is not only one for building up the liver, but it is also efficacious in the restoration of cell and plasma protein and protein stores. All of these must be adequate in order that the patient may withstand the insult of operation.

The giving of plasma transfusions merely to obtain a normal plasma protein level is therefore shortsighted.

The problem of reestablishment of the normal nutritional state, liver function, and protein balance can best be accomplished by the oral ingestion of the diet outlined. Whenever fluids, food and drugs can be tolerated and utilized by mouth this route should be used, since it affords the most balanced diet.

The diet advocated by Ravdin can be prepared in the liquid, soft or solid state, or any combination of these, to suit the oral capacities of the patient. With the use of protein concentrates such as Amigen and Nutramigen and the carbohydrate concentrate Dexin, the caloric values of 3000 can be met with relatively small bulk in the liquid diet.

Amigen has an unpleasant taste which can be modified by fruit juices, particularly grape juice.

If the patient cannot tolerate the diet either because of its bad taste or vomiting, a continuous slow drip via the stomach tube should be tried as described in the treatment of dehydration.

When oral or tubal alimentation is not successful, the parenteral route can be used; indeed, today a practically complete diet can be administered in this manner. Glucose is the source of carbohydrate. Amigen, an enzymatic digest of casein containing all known amino acids, can be given intravenously in a 10 per cent solution of 5 per cent Amigen* and 5 per cent glucose. Most vitamins are available in hypodermic form.

Elman (18) has done much of the work with this product on nitrogen metabolism and has found that both in man and experimental animals a positive nitrogen balance can be maintained by the oral or intravenous form of Amigen as the sole source of protein. When the product was first released for human use it was found advisable to give it slowly because of reactions and urinary loss, the amount usually prescribed being about one gram per kilogram of body weight. Data from The Mead Johnson Laboratories revealed that a positive nitrogen balance could be maintained with 0.7 grams per kilogram in normal active men (36). Of course, this dosage must be increased considerably in a protein depleted patient undergoing a surgical operation. With newer methods of production Amigen no longer causes reactions of the pyrogenic type. At the St. Louis City Hospital, Elman has given as much as 300 grams daily for three days. This worker (19) found in dogs that the daily nitrogen ceiling of utilization was probably above 1.75 grams of nitrogen (11 grams of protein) per kilogram of body weight. The practical application of this finding concerns the rapidity with which human protein deficiencies can be corrected. Certainly the usual daily dose of one gram of protein per kilogram is small in comparison with the probable capacity of the body to assimilate protein once the building stones are absorbed. Indeed, observations by Hartman and his associates (24) on growing children show that as much as 10 grams of protein per kilogram per day could be assimilated.

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* Amigen and Nutramigen were kindly supplied by Dr. Warren Cox, Jr. of The Mead Johnson Company.

This trend is comparable with the great volumes of transfused blood and red cell suspensions advocated by Cooksey (17) in the treatment of anemia.

Fat also has been administered intravenously and, although the volume of research done on this phase of nutrition is neither complete nor adequate, the results are encouraging. Holt et al. (29, 30) have prepared an emulsion of olive oil with lecithin containing 7 to 7.5 per cent lipids which is homogenized at 4000 pounds. It is clear that intravenous fat administration, if feasible, will have important therapeutic applications. As a parenteral food it should be of value in medical or surgical conditions demanding a rest of the gastrointestinal tract; it offers particular advantages in infants with nutritional disorders who cannot digest adequate quantities of food given by mouth and whose fat reserves are already depleted. As a means of introducing calories, fat is more efficient than carbohydrate, and it may be that it serves other more specific purposes as well. Adequate proof of this last possibility has not been presented, but the observations on essential fatty acids, on the bactericidal action of ketogenic diets, on the effect of lipids in eczema, and on the importance of certain lipids in adrenal insufficiency are certainly suggestive. Holt (29) has given this substance to cachectic infants that responded to no other form of nutrition and found their clinical state startlingly improved. Gordon and Levine (23) presented calorimetric data on infants which suggests that fat introduced by the vein is assimilated promptly.

The Japanese have been the leaders in this field and had a commercial product known as Yanol; this, of course, is not available during wartime.

There is no intravenous fat produced commercially in this country, although Holt is earnestly trying to have his solution put on the market at the present time.

Brunschwig (14) has published encouraging results on complete parenteral feeding with glucose, Amigen, intravenous fat, and vitamins. Holt has also done similar work at the Harriet Lane Clinic of the Johns Hopkins Hospital (unpublished work).

A complete parenteral diet is truly a remarkable advance in the care of ill patients.

The role of vitamins in bodily mechanisms recently has occupied the attention of many investigators. Suffice it to say here that adequate dosages are necessary and parenteral forms are available. Vitamin C is closely related to wound healing and the B. complex, with its multiplicity of fractions and actions, bears a direct effect upon carbohydrate metabolism and functioning of the normal liver. It should be remembered that vitamin K given orally must be accompanied by bile salts to assure absorption.

Minot (34) has done some interesting work with calcium in protecting the liver from toxins. She found that amounts of guanidine and carbon tetrachloride which were uniformly toxic to the liver and fatal proved relatively innocuous when the animal was protected with large doses of calcium. Minot and Dodds (35) substantiated this work in humans and found a high percentage of guanidine present in the intestines of infants with alimentary intoxication. In spite of all forms of supportive therapy these infants would not respond without large supplemental doses of calcium.

One should not expect a chronically starved patient to regain a normal nutritive balance in a few days; it may take weeks to restore the liver function, plasma proteins, and similar deficiencies, yet it is absolutely necessary to take the time to correct these conditions.

All of the above may be considered to be superfluous and unnecessary by some who maintain that most patients requiring surgical attention recover without such elaborate therapy and preparation. It is true. Many patients can survive major operations with only minimal care, yet the risk taken is great. One need only witness one postoperative catastrophe, such as a liver death or an evisceration terminating fatally in a patient who was considered a good operative risk, to be convinced. Unfortunately, when this does occur it is too late, even with maximal therapy.

Scrupulous care not only helps to prevent mortality but substantially lowers morbidity in all cases.

There are actually few acute surgical emergencies; even with these some time must be taken to prepare them, as much as the situation permits. For example, in a case of intestinal obstruction not on a vascular basis it is decidedly better to insert a Miller-Abbott tube, decompress and combat dehydration, than to operate immediately. Even the patient with an obstruction caused by a vascular accident should be treated for shock before as well as during the operation. This is true also for hemorrhage.

Alcoholics are always potentially bad risks because of starvation and consequently must be put on a vigorous dietary regime. There seems to be the general feeling among physicians to remove alcohol from the diet of these individuals. However, in the University Hospital series of stab and gunshot wounds sustained by alcoholics and resulting in peritonitis and similar complications, delirium tremens invariably developed. The patients usually became violently uncooperative and the majority of these cases proved fatal. All received large doses of vitamins, glucose and similar medication but to no avail. In view of this the trend now is to keep the patient on his usual amount or even a maintenance dose until he is well over the danger period, and then withdraw it if desired.

Within twelve hours of an elective operation the patient should receive at least 1000 cc. of fluid, orally or otherwise. Coller (16) has found that on the operative day much more than the usual 3000 cc. is needed as the result of excessive sweating while on the table, bleeding, and other developments. A decidedly noticeable clinical benefit results from this simple procedure of hydration.

REPEATED VENIPUNCTURE TECHNIC

In taking repeated blood specimens the use of a spinal puncture needle containing a stylet which fits flush with the bevel of the needle point necessitates only one puncture of the skin. The stylet prevents clotting and is removed when the specimen is to be withdrawn, then replaced until the next specimen is taken.

PREOPERATIVE MEDICATION AND ANESTHESIA

Preoperative sedation varies in accordance with the instructions of the individual surgeon. It is too promiscuously used in large doses. Although it is true that fear and pain are contributing factors in shock, it is not necessary to completely obliterate the sensorium. The dose should be the amount required to "take the edge off."

Blalock (9) has made an important observation in the use of combination of sedatives, finding a much higher mortality rate in experimental shock with nembutal and morphine anesthesia than with the former alone or in combination with ether or a spinal anesthetic. This experience may be projected to clinical surgery, where this mixture in large doses would be used only with definite reservation.

Himba and Curreri (28) studied the effect of morphine, atropine, and scopolamine on the bronchial tree. A patient with a bronchopleurocutaneous fistula was the test object. They placed powdered carmine dye into the bronchial opening and noted the length of time it took for it to appear in the oral sputum. The patient did not cough until she got the stimulus to do so, i.e., until the cough reflex was stimulated by the foreign particles. They repeatedly observed the normal appearance time of the dye and then studied its alteration under the influence of hypodermic injections of the previously mentioned drugs. The results were: "Morphine caused an increase in the appearance time, a percentage change of 11.6 per cent; 1/100 grain of atropine showed an increase of 36 per cent; 1/50 grain showed increase of 37 per cent; scopolamine caused a decrease of 2.3 per cent; with a combination of morphine and atropine there was an increase of 107 per cent; a scopolamine and morphine combination showed an increase of 62.7 per cent."

In view of the fact that hyoscine has a definite effect on the bronchial muscle and a cerebral depressant effect, it would seem that this drug alone in doses of 1/100 to 1/200 grain would serve well as preoperative medication and tend to preclude postoperative atelectasis.

When a regular stomach tube, an Abbott-Rawson or a Miller-Abbott tube is to be used it is better to insert it before the patient goes to the operating room, while he is still cooperative and able to sit up. It is difficult and sometimes impossible to make the insertion when the patient is asleep or in a recumbent position on the table; also, one is more likely to wrongly insert it into the trachea, or to stimulate vomiting and aspiration in the presence of an obtunded cough reflex.

Several points should be mentioned with regard to care in the operating room.

Local anesthesia is not used nearly enough, most probably because it is more time-consuming, bothersome and difficult for the surgeon, along with some mild discomfort to the patient. In spite of this, however, its use in ill patients has definite advantages. All other anesthetics tend to produce some degree of hypoxia, and under general anesthesia the gag reflex may be absent with attending danger of aspiration. Postoperative pulmonary complications are relatively frequent with either the use of a spinal or general anesthetic.

Only under the rarest circumstances should a patient in shock ever be operated on; if this situation does arise, local anesthesia should be used and ice anesthesia if amputation is desired.

The level of spinal anesthesia concerns many anesthetists and surgeons who fear a respiratory death if the anesthesia reaches the cervical level. According to Koster (31) this fear is unfounded. He performed hundreds of thyroidectomies, mastoidectomies and even the excision of sebaceous scalp cysts under spinal anesthesia. One possible explanation of this is a differentially selective anesthesia for sensory and motor nerves, the former being more susceptible to procaine.

One possible cause of sudden death during operations is the hyperactive carotid sinus. The activity of the carotid sinus is profoundly influenced by anesthetic drugs and the technics employed, by the trauma of operative manipulations, and by hemorrhage. Although this discussion is concerned primarily with abnormal or hyperactive carotid sinus reflexes, it may be well to point out that serious disturbances of the normal mechanism may result from anesthetic and surgical manipulation. Heymanns (27) has completed experimental work to prove that factors which paralyze or seriously depress the reflex mechanism regulating or controlling blood pressure, especially the carotid sinus reflex, decrease or abolish the normal compensatory reactions of the body against arterial hypotension. He wrote that one of the main causes of circulatory collapse during severe trauma, hemorrhage, high spinal anesthesia, profound inhalation narcosis with volatile agents, and anoxemia is directly related to the paralyzing effect of these procedures on the normal carotid sinus vasopressure reflexes. Clinical observations have repeatedly borne out the suggestion that profound and lasting shock more often occurs when these factors are in effect and particularly when a combination of two or more of them is present.

The abnormal reactions of a hyperactive carotid sinus may differ. One type referred to as the vagal is characterized by bradycardia, asystole, arrhythmia, hypotension, and cerebral anemia. Another, the depressor reaction ordinarily found in association with one of the other types, produces a vasomotor response with a lowered blood pressure but without significant changes in the heart rate. Still another form, characterized by the clinical symptoms but without alteration in vasomotor tone or heart rate, is known as the cerebral type. All three types of reflex activity are provoked by changes in pressure at the sinus and are manifest by the clinical syndrome associated with psychic changes, fainting spells, unconsciousness, and, less frequently, generalized convulsions.

Atropine in therapeutic doses abolishes the vagal type but has no appreciable effect on the depressor or cerebral types. Epinephrine has some effect both on the vagal and depressor types but does not eliminate the cerebral response. The cerebral type is not known to be greatly improved by drug therapy.

The simple clinical test for establishing the diagnosis is accomplished by mechanical stimulation. That this clinical syndrome is definitely a carotid sinus reflex abnormality may be conclusively demonstrated by diagnostic procaine nerve block with 10 cc. of one per cent solution injected at the bifurcation of the common carotid artery. The nerve block is the treatment when this catastrophe occurs during an operation (40).

Preoperative atropine is almost routinely given to minimize bronchial secretions and spasm, but Booker (10, 11) has found possibly another important reason for its use. He performed experimental work on the chronic effects resulting from downward traction on the liver for a period of one hour. His findings were illuminating and the summary will be quoted:

"The evidence seems to show that damage is done to the kidneys. The injury is probably produced by passive congestion (although possible reflex vasoconstriction is not to be excluded); and the result is renal hypertension which persists for months.

"The changes in the tracings of the electrocardiogram seem to point to the view that traction on the liver results in the derangement of the normal function of the heart, both during traction and some months later. And there is mounting evidence that such manipulation sets up a reflex over the vagus nerve which causes constriction of the coronary vessels, thus reducing the blood supply and probably causing damage to the myocardium.

"Apparently atropine blocks the reflex, for in atropinized animals no significant changes occur in the electrocardiogram either during traction or subsequently."

Acute peripheral vascular collapse also can result under the conditions of some of his experiments.

This experimental work is probably substantiated by the observation of surgeons who, when manipulating the gallbladder of a patient under spinal anesthesia, noted complaint by the patient of precordial pain.

Booker (10) previously, as well as Bamberger (5) found that traction of the liver and main upper abdominal veins caused a temporary inhibition of respiration which could be reduced by double vagotomy. It could be prevented by this procedure or atropinization, plus cocainization of the veins or infiltration of procaine over the surface of the liver.

POSTOPERATIVE CARE

Respiratory stimulation. The average patient on returning to his ward or room is in such a light stage of anesthesia that an airway is not necessary or cannot be tolerated on account of a return of the gag reflex. One notable exception to this is a patient having had sodium pentothal anesthesia; this drug is a definite respiratory depressant and the slightest retraction of the tongue will cause asphyxia. The time interval for the return of consciousness and pharyngeal reflex is unpredictable and, because of this, a safe procedure is the intravenous injection of 5 to 10 cc. of coramine just before leaving the operating room. This sufficiently awakens the patient to render him free from the danger of suffocation.

Oxygen therapy. Upon returning to his bed the initiation of oxygen therapy is to be considered. Although the patient may have neither cyanosis nor dyspnea, subtle anoxia may be present. Anesthesia, bleeding, restricted respiratory excursions, bronchial secretions, and similar conditions tend to favor it. If oxygen therapy is to be effective it should be used early rather than after irreparable damage has occurred.

The following quotation is from Boothby, Mayo, and Lovelace (12): "The amount of oxygen in 100 cc. of arterial blood of the average normal individual, therefore, will be increased from 19.5 cc. when the individual is inhaling air to 22.2 cc. when he is inhaling 100 per cent oxygen. That is, there will be an increase from 10 to 15 per cent in the oxygen content of arterial blood. At first thought, this 10 to 15 per cent increase appears to be comparatively small and possibly negligible. That this increase is not immaterial, however, depends on another factor, namely, the rate at which the blood is circulating through the tissues. The blood as it passes through the capillaries gives up to the tissues, under normal circulatory conditions, only about 40 per cent of its load of oxygen; the venous blood, therefore, is still about 60 per cent saturated, . . . and . . . the average partial pressure of oxygen in the capillaries will correspond to approximately 35 mm. of mercury (effect of carbon dioxide neglected). If for any reason the rate of circulation is decreased, as occurs for example in shock, the blood may give up as much as or even more than 80 per cent of its load of oxygen as it passes slowly through the capillaries; therefore, the venous blood is only 20 per cent saturated and . . . will exert a pressure equivalent to approximately 14 mm. instead of 35 mm. of mercury. Now, if nothing else is done but to cause the patient to inspire 100 per cent oxygen, instead of the 21 per cent oxygen contained in the air, the arterial blood which leaves the lungs will contain, as has been shown, 2.2 cc. more oxygen per 100 cc. In consequence, the capillary and venous blood will also contain from 10 to 15 per cent more and will be 33 per cent saturated instead of 20 per cent saturated. . . . There will be a corresponding increase of partial pressure of oxygen in the capillaries, from 14 to 21 mm., which is the equivalent of a 50 per cent increase in the pressure of oxygen in the tissues." As Boothby and his co-workers reported, the amount of oxygen, after correcting for water vapor in the alveolar air, is between 5 and 6 per cent lower than whatever may be the percentage of oxygen in the inspired air. Both Boothby and Barach (6) warned against the prolonged administration of 100 per cent oxygen and believed that it should not be continuously used for more than forty-eight hours.

The B. L. B. nasal or oronasal aviator's mask should be used for several reasons. The concentration of oxygen with these masks can be made as high as 100 per cent, 90 per cent with ease, whereas the average concentration in a tent is about 40 per cent, with 60 per cent as the maximal. Not only is the efficiency of the mask higher but the operating cost is but a fraction of that necessary to run a tent.

It has been observed by some that noticeably more negligent care is received by the patient who is in a tent, both from the nurses and house staff. This is probably caused by the bulk and unhandiness of the tent. It requires much more effort on the part of the personnel to get to the patient and while being attended he is exposed to room air with further loss in the efficiency of the tent. This difficulty is not encountered with the masks. Boothby, Lovelace, and Bulbulian, the inventors of the B. L. B. masks, have reported that the carbon dioxide content within the mask does not rise above physiologic levels.

The nasal mask is quite efficient for cooperative patients, but the oronasal one is necessary for irrational patients or mouth breathers. Occasionally with the oronasal mask the patient will experience mild subjective fear of suffocation, but reassurance usually allays this feeling. These masks have a plugged hole the size of an average stomach tube, through which the latter may be passed if necessary, thereby preventing leakage and maintaining high oxygen concentration.

The oxygen gauges here are often unreliable and to assure an adequate oxygen supply to the oronasal mask the attending physician tests it on himself first.

The administration of oxygen by means of a nasal catheter is relatively inefficient and should be used when the other means are not available.

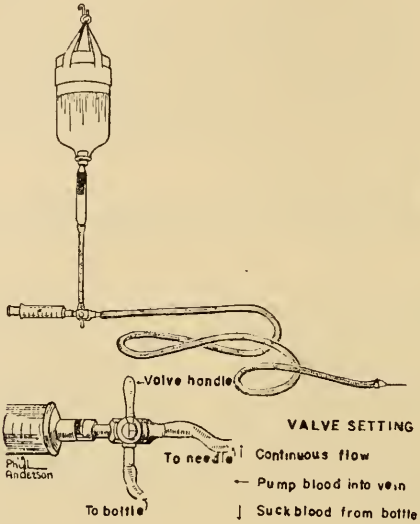
Practical facts in shock therapy. In a shocked patient with collapsed veins it is expedient to puncture the femoral vein with an 18 gauge needle about three inches in length. The procedure consists of feeling for the pulsation of the artery 2 cm. below the inguinal ligament and inserting the needle 1 cm. medial to this, downward and cephalad at an angle of 45 degrees. Constant suction should be created with a syringe after the needle point has pierced the skin so as to readily discern entrance into the vein. No case of thrombosis, thrombophlebitis or embolism has come to light as a result of this procedure.

External and internal jugular veins may be punctured, especially with burned extremities. To puncture the internal jugular vein the head is turned to the opposite side and the needle inserted 2 cm. above the middle of the clavicle, down and in toward the homolateral sternoclavicular joint. The needle should traverse behind the sternomastoid muscle. Suction should be created with a syringe to ascertain entrance to the vein. In marked shock the blood substitute may be pumped in quickly with a syringe connected to a three way stopcock which has the other two junctions inserted into the rubber tubing connecting the infusion bottle and the needle. Thus, by merely turning the valve 20 cc. can be withdrawn into the syringe from the bottle and by resetting the valve it can be inserted into the vein.

These punctures are time-saving for a patient in shock; there should be no delay in cannulating a collapsed peripheral vein. This latter procedure is valid in a chronically ill patient who needs continuous intravenous therapy for days.

After deciding upon the use of oxygen on returning to the ward or room, prophylactic measures must be taken to guard against the two most frequent postoperative complications, distention and pulmonary developments. It may be wisely stated that the best treatment for both of these is prevention.

Prevention of pulmonary complications. The first step is the judicious choice of hyoscine and atropine preoperatively, on the basis of the work done by Himba and Curreri (28). Routine employment of morphine postoperatively is not advocated; much of the pain and apprehension can be alleviated by hyoscine and the barbiturates. Mild pain and discomfort are not contraindicated and may really be of benefit, for the extremely quiet, motionless patient is a good candidate for pulmonary complications.



POSITIVE PRESSURE INTRAVENOUS SET

FIG. 1

Each patient should be told emphatically that stress at the operative site from coughing or moving will do no harm except for the subjective pain and that this should be endured in order to prevent chest complications. Often the mere mention of the word pneumonia will elicit complete cooperation. The patient should be instructed further to take at least twenty deep maximal breaths every hour, turn alone every hour, and to cough at the slightest stimulus. Only a completely cooperative patient can be depended upon to perform these duties. For the average case carbon dioxide inhalations are necessary. Whenever these inhalations fail to prevent complications it is because the procedure has not been followed properly. It should be administered in sufficient quantities and long enough to produce either complaint of pain from deep respiration or vigorous coughing. This period need not be over one minute.

If a patient turns without help, the exertion and muscular effort involved result in greater thoracic expansion and thus help to accomplish the desired effect. The turning referred to means a turn of 90 degrees or more each time, i.e., from lying flat on one's back to a perpendicular position on either side, or even farther over to a modified Sim's position. The usual tendency is to turn only 45 degrees, at which point the patient would still be partially on his back.

The splinting of the operative site during heavy respirations or coughing diminishes the pain somewhat.

Atelectasis most frequently occurs from the first to the third postoperative day and may reveal the physical signs of consolidation, thereby simulating pneumonia which typically appears later. This is important to bear in mind because of the difference in therapy.

Prevention and treatment of distention. Wangensteen (43) has proved definitely that swallowed air is the major factor in causing postoperative distention, realizing, of course, that manipulation, exposure of the intestines, toxicity, and similar conditions are the main underlying factors in causing the relatively immobile state of the intestines. It is therefore inadvisable to give large amounts of oral fluids, particularly through a straw, during the first twenty-four hours or so since much air will be swallowed with these while the patient is in a groggy state.

In contradistinction to this view there are many who advocate the early administration of fluids and food and feel that gas pains are thus prevented and the alimentary tract stimulated. If continuous suction is connected with a regular Levine stomach tube, Abbott-Rawson or Miller-Abbott tube, the swallowed air is evacuated.

Many agents are used to stimulate the intestines; the routine measures are enemas and drugs. Bland enemas are often ordered each morning for three days and mild laxatives given each night, starting on the second day. Many different pharmacologic agents and combinations have been suggested and have proved successful in the presence of mild ileus.

Puestow (37) has reported interesting experimental and clinical studies on intestinal motility in a patient whose illness resulted in a large defect in the right abdominal wall, through which both the large and the small intestines protruded upon straining. He wrote:

"A contrary motility between small and large bowel has been noted. When the small bowel is vigorously contracting, the colon is inactive. When the colon contracts, the small intestine appears to be inhibited. Those drugs including opiates, physostigmine, prostigmin methylsulfate and the choline derivatives which stimulate the small bowel, inhibit the colon. Solutions of posterior pituitary and pitressin produce powerful contraction of the colon but diminish motility of the small bowel. Postoperative distention may be due to the paralyzing action of morphine on the colon."

The routine use of morphine probably accounts for the high incidence of gas pains by virtue of its strong, stimulating action on the small bowel.

Adler, Atkinson, and Ivy (3) using the balloon technic on dogs and humans found the combination of 0.25 mg. ergotamine tartrate, 0.25 mg. of prostigmin methylsulfate, and 1.25 units of pituitrin to be more effective in the management of distention than any of the drugs used alone. On the basis of duration of action, the absence of side reactions with doses which are effective in producing strong propulsive motility, prostigmin is ranked as the best single drug yet investigated. This combination of drugs stimulates both small and large intestines.

Some cases of ileus with distention become so severe as to not respond to the supportive measures of hot water bottles, enemas, and drugs because of the establishment of a vicious circle. Abbott (1) described the mechanism in the following manner: "Originally the normal motility of the intestines is diminished by exposure, manipulation and toxicity, thus allowing fluid, gas, and swallowed air to collect and become stagnant. When not remedied this stagnation causes distention and gradually compresses the vessels of that segment which lay within the wall. Anoxemia ensues with a still further loss of motility. Hence the greater the distention, the more anoxemia, more stasis, and more distention will follow, thus creating a vicious circle." When this state is reached only two known therapeutic measures suffice, the inhalation of 100 per cent oxygen by mask or the use of the Miller-Abbott tube. The latter treatment is absolute if it can be inserted into the duodenum.

Fine (21) has shown both in animals and humans that intractable distention may be relieved with inhalations of 95 per cent oxygen, and that nitrogen and hydrogen are the major constituents of the gases causing it.

The inhalation of pure oxygen accomplishes this result by preventing the entrance of atmospheric nitrogen into the lungs. The nitrogen in the blood and tissues is exhaled rapidly, 60 per cent within one hour. The resulting fall of partial pressure of this gas in the blood not only prevents its diffusion from the blood into the intestine, but at the same time accelerates its diffusion from the intestines into the blood. Experiments showed that after inhalation of pure oxygen for twenty-four hours the volume of nitrogen originally injected into the small intestine obstructed at the pylorus and ileocecal valve was reduced approximately 62 per cent in comparison with an absorption of about 10 per cent when the air is breathed.

With the bulk of the distending gas now absent, distention is relieved, the blood supply restored, and motility regained.

Abbott reported that in extreme cases the blood supply is so curtailed by excessive distention that the transfer of nitrogen in the bowel to the blood will not take place. If this occurs the only method of release is by suction from within the bowel with an intestinal tube. Once the tip of the Miller-Abbott tube is in the duodenum and the balloon inflated, suction withdraws the gas and fluid from that immediate segment of the duodenum. With the resultant return of motility the balloon acts as a stimulus and is propelled by peristalsis to the adjacent segment which is paralyzed. Again continuous suction relieves the distention and restores motility and blood supply and the balloon is pushed on farther. This repetitive process continues until the entire length of the bowel is deflated.

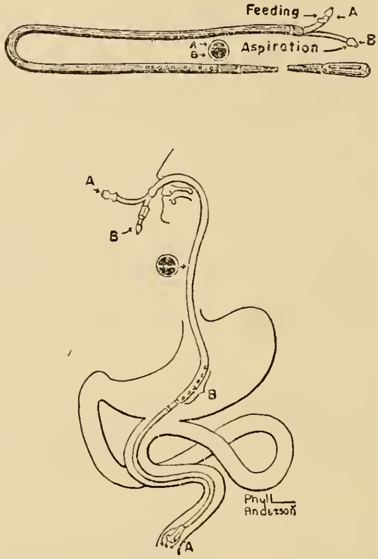
Another salient feature of marked distention is diminished plasma volume (22). Therefore, it is imperative to combat this condition simultaneously with the measures previously mentioned in order to prevent or treat shock.

Shock, as is well known, is a harassing accompaniment of intestinal strangulation and must be treated vigorously before, during and after the operation.

Severe anemia and distention are dangerous coexisting entities. The cause of one death in the University Hospital has been hypothesized along these lines, terminal anoxia and death resulting from anemic anoxia and anoxic anoxia caused by marked respiratory embarrassment from severe distention.

Use of the Abbott-Rawson tube. As previously stated, the Abbott-Rawson or Miller-Abbott stomach tube should be inserted into the stomach before the patient is taken to the operating room, while cooperation can still be obtained. In these specialized tubes this is done for other reasons. The Abbott-Rawson tube already in the stomach is placed in proper position by the surgeon as the gastric anastomosis is being sutured; in the case of the Miller-Abbott tube the surgeon should milk the tip of it through the pylorus well into the duodenum while the abdomen is open. This last point cannot be stressed too emphatically. It takes only a moment to do this, whereas much time and effort will be spent in trying to manipulate the tube into the duodenum after the operation is completed. Furthermore, it may even be impossible to do this, a fact well appreciated by anyone who has attempted it in a patient with severe distention.

The Abbott-Rawson tube has a double lumen, one extending 15 to 20 cm. longer than the other, the total length being about the same as a Levine tube. This instrument is employed in all types of stomach anastomosis with the small bowel and allows postoperative jejunal feeding as well as gastric suction. There is a metal tip on the longer single end similar to the bulb on a Rehfuss tube, which must be removed when inserting the tube through the nose. When the soft rubber end is seen in the oropharynx it is withdrawn through the mouth with a clamp, the tip reapplied and tied securely, and the tube with the tip replaced in the pharynx ready to be swallowed in the regular manner. The tip must be removed in the reverse manner when withdrawing the tube and not pulled through the nose.



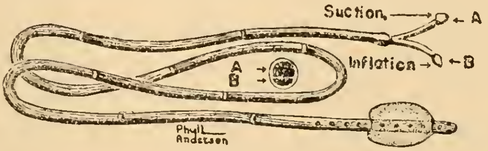
ABBOTT-RAWSON TUBE

Fig. 2

At operation, when the surgeon has put the posterior row of sutures in the anastomosis he places the single barrel down into the jejunum, the end of the short lumen being placed at the anastomotic site. Any redundancy is withdrawn through the nose and the tube is securely taped to the face.

Postoperatively the patient may be fed through the long end into the jejunum while constant suction is effected through the shorter one, thus relieving swallowed air and excess fluid and preventing distention and disruption of the suture line. The food to be administered should be, for the most part, predigested because the stomach is temporarily short-circuited. Nutramigen is a complete food, except for vitamins. The protein contained therein consists of 20 per cent of Amigen, and 42 per cent of carbohydrate dextrimaltose, both predigested. It also contains 18 per cent of corn oil, 10 per cent of arrowroot starch, 3 per cent of Brewer's yeast powder, and calcium, potassium, and magnesium in small amounts. This powder in amounts sufficient to supply the desired calories serves well in a diluent of normal salt made up to the desired fluid intake. If necessary the mixture may be supplemented with glucose, which should not have a concentration of more than 10 per cent so as to be innocuous to the jejunal mucosa.

The total volume of the mixture is put into an infusion bottle containing a Murphy drip bulb and should be given slowly and continuously at a rate of 40 to 80 drops a minute. The feeding is usually started after twenty-four hours, intravenous alimentation being given up to that time. Occasionally there is considerable reflux of the infusion from the jejunum into the stomach, which is then in turn sucked out. With a slow drip suction can be used intermittently with safety, thus allowing time for absorption and advancement of the food in the jejunum.



MILLER-ABBOTT TUBE

Fig. 3

Vitamins and other pills can be crushed, made into a suspension, and injected with the liquid diet.

The tube remains in place until the surgeon feels an adequate balanced diet may be tolerated orally.

Problems of fluid, electrolyte balance, and suction will be considered jointly in the discussion of the Miller-Abbott tube.

Use of the Miller-Abbott tube. This tube is also a double-barreled instrument about eight feet in length, long enough to be inserted through the nose, traverse the entire gastrointestinal tract, and appear at the anus. It has a balloon 1 cm. proximal to its tip and this is connected with one lumen through which air may be passed to inflate it. The other barrel extends the entire length, is perforated at the tip and proximal to the balloon for a distance of about 10 cm., and is used for suction. The method of its use has already been discussed along with the treatment of distention, but a few further details will be given.

It should be employed in all resections of the intestine distal to the jejunum and in any case where ileus is anticipated, i.e., peritonitis, abscesses, and similar conditions, for after the tube is in the duodenum the treatment of distention is never a concern.

To reiterate, when any of the above procedures are to be done insert the tube into the stomach prior to operation, so that when the abdomen is open the surgeon can milk the tip through the pylorus; once the balloon is inflated in the duodenum, no further difficulty is encountered. Abbott (2) reported that the development of a stylet suitable for use in the Miller-Abbott tube has frequently made possible the prompt passage of the tip into the duodenum, yet experience here reveals difficulty most of the time.

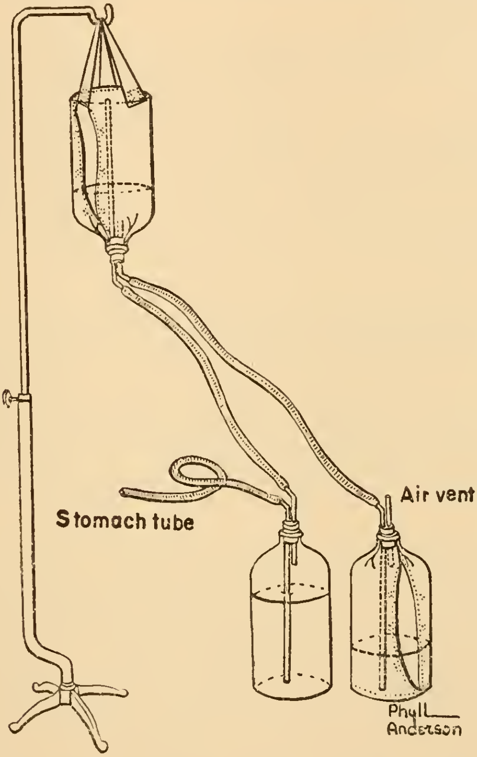
After the operation the tube is fed slowly through the nose at the rate of about one foot every hour, peristalsis milking the balloon along until it approaches the anastomosis, at which time it is deflated to prevent intussusception. The tube is then taped securely to the face. When in place any low residue or liquid diet can be fed the patient orally. Absorption occurs along the bowel proximal to the tip where all excess is removed by suction, thereby safeguarding the suture line. The nutritional, fluid, and electrolyte needs of the patient may thus be served orally without delay.

All fluid lost from the intestinal tract must be replaced in addition to the average daily intake of 3000 cc. The enteric juice is for all intent and purpose protein-free plasma and may be replaced practically with physiologic saline, be the loss from the stomach or the ileum. It is interesting to remember that the intestinal secretions are 6000 to 10,000 cc. daily, most of which are normally reabsorbed. When considering such a volume the amount withdrawn by suction with a Miller-Abbott or Abbott-Rawson tube can be considerable. In order to measure correctly the amount of fluid sucked out by any tube, a trap or collecting bottle is inserted into a double Wangensteen setup.

The volume is easily measured with this arrangement and the trap can be emptied by simply clamping off the suction tube to the upper bottle. In using two Wangensteen bottles continuous suction is maintained with a minimal effort by replacing the empty top bottle with the lower one, which becomes full after an equal volume of fluid and air is withdrawn from the bowel; the tube connections are altered accordingly. This obviates repeated filling and the drainage confusion when a single bottle is used. In addition, the trap bottle is a safeguard against reflux of the contents of the top bottle into the stomach as a result of improper connection of the tubing, for if this mistake is made the fluid gravitates into the trap and the error is noted.

If large volumes of fluid are given intravenously to replace the previously mentioned loss in a hypoproteinemic patient, edema must be expected. The most pertinent and dangerous sites are the intestinal anastomosis, abdominal incision, and lungs. Edema may occur when the plasma proteins are low, because of insufficient osmotic pressure to handle capably the infused fluid even with a normal heart. Ravdin has shown that disruption occurs mainly from hypoproteinemia with poor tissue repair.

Many postoperative patients who have been chronically ill and who received abundant intravenous fluid are potential candidates for cardiac insufficiency. It may be a good thought to give supportive doses of digitalis even without signs of failure, rather than run the risk of precipitating pulmonary edema. One to three cat units the first day and one unit a day thereafter should suffice until clysis is discontinued.



DOUBLE WANGENSTEEN SUCTION SET

FIG. 4

Hepatorenal syndrome. A clinical state to be avoided most carefully by the surgeon is the so-called hepatorenal syndrome. This entity, a clinical one predominantly, has been given much attention by Heyd (25, 26), Boyce (13), Wilensky (44), and others.

Although a well defined clinical syndrome is recognized, the etiology and pathologic physiology are in the speculative stage. With regard to the latter, a composite view of the aforementioned authors will be given.

As has already been stated, the liver, because of its size and reproductive power, must sustain an extreme amount of damage in order to manifest the insult clinically. In many patients, particularly in those with dietary difficulties, damage is present as proved by serial function tests, even without gross clinical symptoms.

Apparently the trauma and exposure at operation, blood loss, anoxemia, tissue damage, and anesthesia, are the precipitating factors in causing a fulminating insufficiency. These insults, which incidentally have been shown to decrease function even in a normal organ, are the factors which throw an already damaged but compensating liver into this catastrophic state. This causation has been seen in such conditions as postoperative intestinal resections, thyroidectomies, cholecystectomies, intestinal obstruction, and peritonitis.

In cases of sudden massive tissue destruction, such as lacerated or ruptured liver, crush injury, shotgun wounds with multiple and massive damage to lungs, bowel and other organs, this syndrome occurs in the presence of a normal liver or one supposedly so in an individual who was healthy prior to the accident. Here the tissue damage alone is so overwhelming that it can cause a fulminating insufficiency without previous liver damage. Perhaps the most toxic tissue in the body is previously normal liver tissue undergoing autolysis.

The hepatorenal syndrome may be manifest in two forms. The first occurs within seventy-two hours of the insult, when for no apparent reason the temperature rises and continues to do so for the next eight to twenty-four hours until death, often reaching 107 to 109 F. The patient during this state becomes apathetic or restless with carphology, gradually loses consciousness, and finally lapses into deep coma. Frequently there is terminal peripheral vascular collapse with icy extremities, in spite of the hyperpyrexia. Blood cultures and a careful autopsy reveal no evidence of infection, and no characteristic blood chemistry or hematologic studies are found. This form, it is thought, appears in overwhelming damage to either a previously normal or abnormal liver and the patient dies of a liver death.

The second form is supposedly the result of milder insult or toxicity and here also, for no apparent reason, on the fourth or twelfth day oliguria appears in an otherwise normal looking individual, and gradually progresses to anuria and an uremic death. The temperature, pulse rate, and respirations remain within normal limits, and neither jaundice nor any other gross liver symptoms need be present. It is thought that in the latter, the less toxic form, although the liver function is impaired the toxins are not sufficiently potent to cause an immediate liver death. In the presence of this improperly functioning liver the kidney tries to take over the detoxication; since this organ is mainly an excretory one, however, it is overpowered and as a result anuria develops.

Conceivably the toxin, an admittedly poor term, is the aberrant metabolic product of protein metabolism formed from the ischemic and damaged tissue. In small doses the liver can detoxify these products without untoward effect; but when excessive doses are imposed upon a normal, and usually an already impaired liver, it cracks under the strain and evidences this breakdown in the hepatorenal syndrome.

Pathologically, the liver shows wide variations in the quantity of necrosis. Sometime the areas may be large, simulating subacute yellow atrophy, but more often scattered punctate areas are seen without any characteristic location. The kidneys are injured in the region of the convoluted tubules with degrees of damage varying from cloudy swelling to complete cell death, casts being formed by extrusion of the debris into the lumen. The renal pathology may be minimal or even absent in the hyperpyrexic cases because the patient dies before the overflow of toxins is able to exert a damaging effect on the kidneys.

The few casts that are sometimes seen definitely do not cause anuria by mechanical blockage. This is also true in other forms of tubular nephroses, such as in blood transfusion reactions, burns, heavy metal poisoning, crush, some cases of sulfonamide toxicity, and similar conditions. It has been definitely proved by Richards (39) that with this tubular cell damage there is an overall unselective tubular reabsorption of the glomerular filtrate, whereas in the normal kidney only nine-tenths of it is reabsorbed, the remaining tenth proceeding along to the collecting ducts and being excreted. This factor is important in the consideration of therapy for these types of anuria, none of which is really effectual. Fortunately, these cells have a remarkable ability to recover and will do so in one to three weeks if the patient lives that long and the toxicity is not too severe.

There is a great tendency to overhydrate these patients in an effort to bring about the flow of urine. This procedure is dangerous because of the possibility of causing water intoxication and death. No intravenous therapy known will cause an increase in the excretion of urine in these cases; therefore, conservative amounts of fluid should be given to prevent death from water intoxication and to allow enough time to permit spontaneous regeneration of the tubular epithelium. Death usually supervenes, however.

If a patient with typical hepatorenal symptoms does survive there is no real proof as to the authenticity of the diagnosis; there are no pathognomonic objective tests and therefore the diagnosis is probably incorrect. The treatment is prevention or preoperative liver care, as has been mentioned previously. Usually therapy is without success after the entity has appeared.

SUMMARY

All of these methods of treatment and precaution may be considered by some to be superfluous and unnecessary, since most acutely ill patients requiring surgical intervention recover without such elaborate and time-consuming preparation and care. It is true. Many patients can survive major operations with but minimal care, yet the risk involved is great. One need experience only a single catastrophe, such as a hepatorenal death or a wound disruption terminating fatally in a patient who was considered a good risk, to realize the vital importance of pre- and postoperative attention. Scrupulous care not only helps prevent mortality but substantially lowers morbidity in all cases.

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COMMENCEMENT ADDRESS*

BRIG. GEN. FRED W. RANKIN, M.C., U.S.A.†

For the opportunity to be here this evening and to participate in the activities of this occasion, accept my expressions of sincere appreciation. The realization that this is my Alma Mater intensifies my humble respect and gratitude for the high honor which has been so generously bestowed upon me in asking me to address you at these exercises.

I can well recall a similar occasion when, as a member of the graduating class, I sat in this very hall experiencing the conflicting emotions of genuine pleasure, zestful anticipation, and serious contemplation which you are probably experiencing now. The satisfying and happy sensation of having successfully completed the first great step of a journey which has tested well your mental endurance and strength of character is tempered by the sobering wonderment at your possible role in the galaxy of future events. These solemn reflections have been inevitably influenced and undoubtedly heightened by the explosive events of the current conflict. It is only natural that these turbulent and distracting forces should produce an introspective panorama of disquieting thoughts in your minds. Standing now at the threshold of the fulfillment of all your hopes and ambitions there looms before you the grim uncertainties of a war-destined career. The previously cherished plans and long sought aspirations toward which you have assiduously toiled and made many sacrifices seem suddenly shattered and must now be revised in accordance with the unpredictable and kaleidoscopically changing pattern of a world at war.

In view of the understandably grave concern which these disturbing factors have caused in your minds regarding your immediate and future role in medicine, it may be desirable to describe briefly what may be expected of you in the assignment you will soon be given and to consider some of the postwar professional rehabilitative measures that would permit the resumption of a professional career in accordance with your desires and special talents.

Immediately after our enemies treacherously launched us into this holocaust, the full gigantic resources of this country were rapidly mobilized and all efforts directed toward the preparation of its industries and manpower for war on an unprecedented scale. During the past two years these stupendous efforts have resulted in the creation of a formidable military machine with irresistible striking power. In this national metamorphosis the medical profession with its tremendous responsibilities has participated enthusiastically and efficiently. The increasing demands imposed by the expanding military and industrial needs for adequate medical care were

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* Given at the Commencement Exercises of the University of Maryland School of Medicine and College of Physicians and Surgeons, and the University of Maryland School of Nursing. The Lyric, Baltimore, December 23, 1943.

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BRIGADIER GENERAL FRED W. RANKIN
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quickly met. Forty per cent of the usable medical personnel of the country has been withdrawn in order to meet the requirements of the Armed Services alone. Obviously this has greatly increased the burden already weighted by the paralleled industrial expansion, which must be shouldered by the thinned rank of the remaining civilian physicians. Despite these unavoidable difficulties and increased responsibilities our functional performance has been maintained at a high level. This is clearly demonstrated by the maintenance in our nation and our Armed Forces of a high standard of health.

These early and most exigent phases of mobilizing and preparing our medical resources for war have been expeditiously completed. At present the most urgent need of our Armed Forces is for young medical officers required to serve with our fighting troops. Because physical vigor and mental alertness, so essential in the successful performance of these duties, are attributes which you possess, great dependence has been placed upon you in meeting these demands. Accordingly it is expected that most of you will enter the service upon completion of an internship. Following this you will go through a period of indoctrination in order to acquaint you with military customs and practices and to prepare you for the various duties which you will assume. During this training program you will receive instructional courses in tactical features of medical service, in field sanitation, in problems of early care of the wounded and their evacuation, in the peculiar problems connected with the management of gas casualties, in the unique phases of aviation medicine, and in many other branches of special medical service organization. The knowledge which you will obtain during this intensive period of specialized training will not only serve to prepare you for your immediate assignment but will remain of valuable assistance in many of your future activities.

The importance and magnitude of your duties and obligations in this new assignment far exceed its commonly considered prosaic character. Prepared to function in the versatile role of physician, sanitarian, and soldier you will comprise the vanguard of Army Medical Service. As physician you will be required to apply your special talents and skills in the care of the sick and injured and in sustaining and bolstering the spirit of the troops you are serving. The care of combat injuries not only embraces the application of first-aid measures and emergency surgical procedures, but also the quick and careful assessment of individual casualties in order to execute rapid triage and consequent evacuation. The final results obtained by the subsequent treatment of the wounded depend considerably upon the successful performance of these early functions. While this constitutes one of the major tasks of medical officers, of equal or even greater importance are the mental illnesses which must be prevented and corrected. The mental hazards and emotional disturbances which are the frequent consequences of the powerful psychic stimuli of warfare have been greatly heightened by the extreme mobility and extensive mechanization of this war. These conditions which can so easily wreck the aggressive spirit of a fighting force and destroy its military usefulness must be averted. This demands constant vigilance, alert perception, and sympathetic understanding on the part of medical officers who serve with fighting troops. It is their responsibility to prevent and to recognize and to correct promptly these highly jeopardizing and potentially selfannihilating disturbances.

In addition to the duties of ministering to the sick and wounded, you will be required to perform the extremely important role of sanitarian. In this capacity you are perhaps concerned with the most significant medicomilitary function. History is replete with examples of its importance; battles have been won and lost on this basis. Because sanitary problems are ubiquitous and because they concern the entire military population, your attention and efforts must be constantly devoted to such matters. The combatant superiority which must be assured our fighting forces largely depends upon the manner in which you perform the functions of conserving and maintaining healthful conditions.

This brief description of the responsibilities, qualifications and manifold attributes of the medical officer who accompanies combat units seems imposing. They have nonetheless already been demonstrated by medical officers now serving in this capacity. In a recent tour which carried me to all the far-flung battlefields of this globe-encompassing war I had the privilege of observing the functional performance of many young physicians. The resourcefulness, the mental and physical stamina, the courage, the professional competency, and the efficient adaptability which these medical officers displayed in the cheerful execution of their tasks under the most hazardous circumstances and adverse conditions was inspiring. You can take great pride in soon joining the ranks of this gallant legion.

And now may I not briefly consider certain problems which I know will interest you and which are intimately connected with, and in great measure consequent to, the military exigencies? They are concerned primarily with the subject of postgraduate medical education after this war ends. The fact that the consistent elevation in the standards of medical practice in this country has paralleled the progress made in postgraduate medical education clearly reveals the significance of the subject.

Our formal educational programs both in the liberal and specialized fields have already been forced to undergo certain abbreviations, deletions, and accelerations. Moreover, postgraduate medical education which in recent years has been progressing toward standardization has also received a definite setback and faces further disorganization and recession because of the necessary disturbance in the resident system which constitutes the framework supporting postgraduate medical education. It must be readily apparent now that a broadening gap is developing in this system and especially in the specialized fields of endeavor. This must be accepted as the inevitable consequence of war and the necessity of stripping teaching centers of both instructors and students for the more urgent demands of the Armed Forces. Accordingly the breadth and depth of this gap will depend upon the length of the war, but I am convinced that it is already of sufficient scope to produce definitive effects upon the character of medical practice for some time after the war. It seems to me, however, that much can be done to cushion these effects and to shorten their period of influence by an intelligent, intensified, and well planned postwar program of postgraduate medical education.

This is admittedly a complex problem and one which will demand careful thought and deliberate consideration by educators, academicians, and leaders in the various branches of medicine. Some realization of the difficulties involved in the establishment of a satisfactory program of postwar postgraduate medical education may be obtained by citing a few of the factors that must be considered in its planning. Thus, there are those young physicians who entered the service immediately upon completion of an internship and others who entered after one to several years of formal training in a specialized field. Then there are still others who have little or no formal training, but who have been in practice for a short period which has made them realize their inadequacy even more forcefully and who will be determined to obtain specialized training after the war. In addition to providing means of completing the training of these varied groups some thought must be given to those general practitioners whose assignment in the service has been necessarily nonclinical and who will feel the need of refresher courses before resuming civilian professional pursuits. Moreover, certain economic phases which concern the individuals seeking training as well as the institutions providing it require consideration in such a program. Since in the past this type of training has been limited to only a limited number of medical centers and institutions with the proper personnel and clinical material for its establishment, it is doubtful whether such postgraduate facilities will be adequate to meet the additional postwar needs. Some provisions for expanding educational facilities of the various institutions and agencies that can make available basic science courses, hospital residencies, fellowships, graduate studies, and refresher courses in the different branches of medicine will apparently be necessary. These and numerous other factors must be considered in formulating plans for postwar postgraduate medical education that will satisfactorily meet the comprehensive needs involved in these complex problems.

It becomes increasingly apparent that this is a subject of great magnitude and wide scope. It is intimately concerned with the character and level of medical practice and deeply affects the direction and rate of medical progress. Because of the commendable potentialities as well as the dire consequences that can be projected into the future of medicine, depending upon the procedure followed in dealing with these problems, it becomes imperative during this transition period to prepare the ground work and plan the structural frame of a concrete comprehensive program for postgraduate medical education that can be put into operation as soon as the difficult postwar reconstruction period begins. Considerable comfort and reassurance may be derived from the fact that our leaders are keenly aware of the significance and necessity of participating in postwar planning and of developing and organizing an efficient program of postgraduate medical education. The Council on Medical Education and Hospitals already has "initiated a preliminary survey to determine all available and potential facilities for advanced training in connection with intern and residency hospitals, undergraduate and graduate medical schools, clinics, departments of health, state medical associations and other agencies interested in graduate or postgraduate education." While this survey has not been completed, the sincere interest that has been created and the eager cooperation reflected in the preliminary reports are most encouraging. Other noteworthy developments in this connection are the Wartime Graduate Medical Meetings that have recently been organized under the auspices of a committee representing the American Medical Association, the American College of Surgeons, and the American College of Physicians. These programs planned for physicians in the Army, Navy, and Public Health Service and for physicians in civilian life who reside within reasonable traveling distance of the camp and hospital in which the meetings are held embrace topics of vital interest presented by outstanding speakers and include a teaching schedule of ward rounds, clinics, practical demonstrations, lectures, and conferences. It should also be observed that insofar as practicable some opportunities are afforded for specialty training in Army and Navy hospitals. Of especial interest in this connection is the fact that appropriate consideration of training experience gained during military service will be given by the respective specialty boards.

These commendable efforts clearly reflect the sincere interest manifested by our leaders in this important subject. The constructive measures proposed and those already in operation will serve to mitigate partially the effects of the deprivation in graduate training imposed by current exigencies. It must be accepted, however, that much more will be necessary before an effective and suitable program of postwar postgraduate medical education, fundamentally designed to meet all the requirements, will have been formulated. This is admittedly a difficult and arduous task, but one whose significance deserves the eager cooperation and untiring efforts of all concerned. Our success in meeting these responsibilities will depend largely upon the interest and zeal with which we approach these problems and the judgment and intelligence employed in their solution. Our individual efforts—yours and mine—are essential in the attack upon them, and the responsibility and obligation for their successful conclusion is our task. That we shall not fail to carry on in the tradition of our guild is beyond peradventure.

Members of the graduating class, I wish you success and Godspeed.

PROCEEDINGS
of the
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ONE HUNDRED AND THIRTY-FIRST PROGRAM MEETING

The One Hundred and Thirty-First Program Meeting was held on Wednesday, January 19, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

The program consisted of a paper on "Observations on Epithelium as a Dominant Histological Tissue," by Dr. Carl L. Davis, Professor of Anatomy, Department of Histology and Embryology, School of Medicine, University of Maryland. An abstract of this paper follows.

OBSERVATIONS ON EPITHELIUM AS A DOMINANT HISTOLOGICAL TISSUE

Carl L. Davis, M.D.*

A study of the recently acquired group of Hertig and Rock human embryos shows that following segmentation development proceeds by the formation of epithelium about fluid filled spaces or cavities.

The first such space (a) is the segmentation cavity, and the epithelial tissue surrounding it is the trophoblast. In sequence there follow (b) the amnionic cavity with its overhanging sac and basal germ disk or ectodermal plate, (c) the archenteron or yolk sac with its enclosing endodermal epithelium, and then from the epithelioid mass of the middle germ layer (d) the somites with their contained myoceles, (e) the pronephric vesicles, and (f) the lateral plate with its enclosed body cavity.

The nonepithelial neurones and neuroglia form secondarily from tissue sequestered from a free surface environment, as do the fibromuscular and vascular elements derived from the middle germ layer.

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* Professor of Anatomy, Department of Histology and Embryology, School of Medicine, University of Maryland.

Thus epithelium becomes the primary type of histological tissue from which other varieties may form. Its differentiation is controlled by its environment and so is not dependent upon its source of origin from any given germ layer.

ONE HUNDRED AND THIRTY-SECOND PROGRAM MEETING

The One Hundred and Thirty-Second Program Meeting took place on Wednesday, February 16, 1944, at 4:00 P.M. in the Bressler Lecture Hall.

Dr. L. P. Ditman of the Department of Entomology, University of Maryland, College Park, presented a paper entitled "Some Problems in Insect Physiology and Their Economic Application."

ALUMNI ASSOCIATION SECTION

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The names listed above are officers for the term beginning July 1, 1943 and ending June 30, 1944

COMMENCEMENT EXERCISES

December 23, 1943

The Lyric—Baltimore

ORDER OF EXERCISES

I. The Procession: *The Coronation March*, Meyerbeer; *Pomp and Circumstance*, Elgar.

II. Invocation: Rt. Rev. Noble C. Powell, D.D., *Bishop of Maryland.*

III. Greeting: H. C. Byrd, B.S., LL.D., D.Sc., *President, University of Maryland.*

IV. The Address: Brig. Gen. Fred W. Rankin, M.C., U.S.A.

V. Conferring of Degrees and Certificates: President H. C. Byrd.

Presentation of Commissions in the Medical Corps, A.U.S.: Lieut. Col. W. A. Howland, Commandant, U.S.A.

Presentation of Commissions in the Medical Corps, U.S.N.R.: Lieut. Marvin S. Lee, Commanding Officer, U.S.N.R.

Presentation of Graduates: Dr. Walter L. Hard, Assistant Professor of Histology.

Class Roll

Elizabeth Acton
Ruth Workman Baldwin
William Riley Ballard, Jr.
Lillian Feykert Bennett
Herbert Lee Berry
Joseph William Bitsack
Frederick Bertram Brandt
Henry Thomas Brobst
Charles William Brown
James MacKay Brown
Ernesto Colon-Yordan
Elmer Ellsworth Cook, Jr.
William Nye Corpening
Robert MacGonigle Crosby
Robert Kimber Curtiss
Alfred Henry Dann
Edward Colson Day
Harold Dillon
Hamilton Peacock Dorman
John Justin Doyle
Daniel Ehrlich
Henry Guy Ferri
Aaron Nathan Finegold
Mary Jane Foley
Augustus Homer Frye, Jr.
Eli Galitz
Richard Mitchell Garrett
Albert Gubnitsky
Joseph Roy Guyther
William Myrick Harris
John Stevenson Haught
Francis Eugene Hornbrook
Manuel Antonio Iguina-Jimenez
Gabriel Andrew Ingenito
Charles Hal Ingram
Luis Manuel Isales
Melvin Joseph Jaworski
Dan Franklin Keeney
Charles Alexander Kemper
Earl Ray Kinney
Ishmael Worth Kirby
Allen Kleiman
Clarence Vinette Latimer, Jr.
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Arnold Robert Marks
Lloyd Leo McCormack
Robert Burns McFadden
William Edward McGrath, Jr.
Joseph Frederick McMullin
DeVoe Kepler Meade
Angel Neftali Miranda
Jack Calvin Morgan
Myron Joseph Myers
Alfred Turner Nelson
Isaac Floyd Nesbitt
John Casimir Ozazewski
John Michael Palese
Robert Joseph Peters
Edgar Thornton Pfeil
Samuel Ronald Pinas
William Henry Pomeroy, II
Francisco Luis Raffucci-Arce
James Jacob Range
Cliff Ratliff, Jr.
Norman B. Ream
John Munn Recht
Arthur Middleton Rinehart
Merritt Ezekiel Robertson
George Carraway Rogers
William Brannon Rogers, Jr.
Stevenson Parker Santiago
Rocco Louis Sapareto
Irving Scherlis
Frank Mollman Shipley
James Samuel Shortle
Frank Mason Sones, Jr.
John Thomas Stegall
Harold Sterling
Martin Edward Strobel
Glenn Olson Summerlin
Talmadge Stanley Thompson
LeRoy Wortendyke Tilt, Jr.
Dharma Luz Vargas
Grayson Spencer Waldrop
Harry Ernest Walkup
George Brooks West, Jr.
David Reid Will
Thomas Richard Williams, Jr.
Paul Randall Ziegler

VI. Awarding of Honors: Dr. Robert U. Patterson, *Dean.*

University Prize Gold Medal

LILLIAN FEYKERT BENNETT

Certificates of Honor

LeRoy Wortendyke Tilt, Jr.
Arnold Robert Marks
Ernesto Colon-Yordan
Joseph Roy Guyther
Edgar Thornton Pfeil

VII. Administering of Hippocratic Oath: Thomas P. Sprunt, M.D., *Professor of Clinical Medicine.*

VIII. Benediction: Rt. Rev. Noble C. Powell, D.D., *Bishop of Maryland.*

IX. The Recession: *March of the Priests*, Mendelssohn.

THE 137TH ANNUAL BANQUET

The 137th Annual Banquet of the Medical Alumni Association tendered in honor of the graduating class was held at the Emerson Hotel on December 21, 1943.

NEWS FROM THOSE IN THE ARMED FORCES

SOME FACTS THAT CAN NOW BE DISCLOSED CONCERNING THE 142ND GENERAL HOSPITAL

In the island telephone exchange the 142nd General Hospital is listed "Maryland." It arouses pangs of homesickness to lift the receiver and hear a crisp American voice announce: "This is Maryland. Number, please!"

The ward and residence buildings of this unit are long, low, semipermanent wooden structures with corrugated iron roofs. They are ideally suited for the tropical climate. The outside walls are painted bright yellow and glisten in the sun, making it possible to see the hospital for miles in any direction. Most of the inside walls are gleaming white.

The officers live two in a room in the horseshoe-shaped building, with all the rooms facing the courtyard full of tropical plants and flowers. They sleep on Army cots under mosquito nets, with the large unscreened windows left wide open to admit the cool breeze that blows in from the sea on even the hottest nights.

Many improvements have been made during the past year. Concrete sidewalks now connect all buildings, thus eliminating the necessity of wading through mud which is the curse of this island in the rainy season. All ward buildings are connected by partly covered corridors for wheeling patients to and from the operating rooms. A large amphitheater provides a location for shows. Several new ward buildings with broad sunny porches have been built.

The Red Cross built a recreation hut and furnished ping-pong tables, a library, and a genuine juke box which plays without nickels. Many more improvements are planned.

Serving under Colonel Copeland are a number of prominent Baltimore doctors. Though they are finding plenty to do life on this island is not all work, as most of them readily admit.

Lieut. Col. Harry C. Hull, chief of the surgical service, is one of the hospital's most enthusiastic hikers.

Major Walter L. Kilby, Acting Professor of Roentgenology, is chief of the roentgenologic section and shares Colonel Hull's enthusiasm. Together they have seen much of the island's terrain at close range.

Lieut. Col. Henry V. Langeluttig, head of the medical service, has gained considerable fame for cornering the island's crab market and staging huge crab feasts in the mess hall.

Major Horatio W. Newell, Assistant Professor of Psychiatry, is chief of neuropsychiatry. Major Francis G. Dickey, Instructor in Medicine, is in charge of the medical service. Both are the hospital chess experts.

Major Howard B. Mays, Instructor in Genito-Urinary Surgery and Assistant in Pathology, heads the urologic section of the hospital. In his spare time he visits native villages, studying customs and collecting curios.

Capt. George H. Brouillet, Assistant in Surgery, Major Harry M. Robinson, Jr., Associate in Dermatology and Assistant in Medicine, and Capt. Lauriston L. Keown, Assistant in Pediatrics, have obtained photographic equipment and are following their hobby seriously.

Capt. William G. Helfrich, Instructor in Medicine, is serving as receiving and disposition officer. He is the unofficial coach of the post baseball team, which won the island championship last season.

CITATIONS

Col. Maurice C. Pincoffs, chief consultant in medicine in the Southwest Pacific and former Professor of Medicine of the School of Medicine, University of Maryland, has been awarded the Legion of Merit for experiments in malaria control. These were conducted on an island north of Australia and most of those who participated in them were volunteers. Among them was a company of engineers; the others were members of a medical detachment.

Colonel Pincoffs, whose headquarters are in Australia, was made chief of professional services in the Southwest Pacific in January, 1943. He went to this area as head of the 42nd General Hospital.

Colonel Pincoffs' decoration, the Legion of Merit, ranks fourth among the Armed Services' awards but is the most ornate. Congress created it in 1942 at the request of Secretary of War Stimson for "exceptionally outstanding conduct in the performance of essential service" during war.

Capt. Theodore E. Woodward, Class of 1938, has been cited for his work in typhus fever at the Pasteur Institute in Casablanca, Morocco, and has been made a member of the United States Typhus Commission working in Africa and Italy. The citation, signed by Brig. Gen. Leon A. Fox, field director for the typhus commission and a physician, read as follows:

"Captain Woodward went to Africa as a member of a general laboratory unit of the first American contingent. On arriving in Morocco, Captain

Woodward landed in the midst of a typhus epidemic. Having had special training and previous experience with typhus, he immediately realized the danger to American troops. He arranged for assignment to the Pasteur Institute at Casablanca, where he instituted cooperative studies and investigations with the French scientists, the nature of which for the time must remain a secret, but which are of great value to our program of controlling typhus fever."

PROMOTIONS

Word has been received from General Headquarters, Southwest Pacific Area, that Lieut. Col. George H. Yeager, Commanding Officer of the 42nd General Hospital, was raised to the rank of full colonel on January 6, 1944.

Colonel Yeager, who carried a reserve commission as a major, was called to active duty in April, 1941. He was assigned as chief of the surgical section and executive officer of the hospital with which he is presently serving. He went overseas in June, 1941 in that capacity and in December, 1942 was promoted to Lieutenant Colonel and assigned commanding officer.

Major Robert C. Crawford, Class of 1938, was promoted from captaincy several months ago.

Capt. Harry M. Robinson, Jr., Class of 1935, was recently promoted to the rank of Major. He is serving with the 142nd General Hospital as dermatologist and venereologist, and is consultant in skin and venereal diseases at another base hospital.

Since going to the Southwest Pacific Major Robinson has been consultant to the civilian population and has visited and treated some of the chiefs of the tribes of the Fiji Islands in addition to some of the British officials. He has also visited some of the leper colonies and photographed a number of interesting cases.

Capt. R. C. Vail Robinson, Class of 1940, recently was promoted to his present rank. He is somewhere in Britain at a general hospital and is in charge of medical service which includes dermatology and syphilology.

Capt. Stanley E. Schwartz, Class of 1941, was recently promoted to his present rank and is detachment surgeon of the 20th AAF Technical Training Detachment, Middle River, Md.

Capt. William Templeton Layman, Class of 1939, was promoted to his present rank in April, 1943 and is now serving overseas.

First Lieut. Morton E. Hecht, Jr., Class of 1940, was raised to the rank of Captain.

HEADQUARTERS
42nd General Hospital
A.P.O. 923

6 January, 1944

Dear Dr. Shipley:

Your letter of December 14 received today and thoroughly enjoyed. Apparently there has been a considerable interlude since you have heard from me. One of my letters must have gone astray.

Recently we have received a very generous sum of money from the Maryland Medical Alumni Association, the staff and Women's Board of the Union Memorial Hospital, and the Women's Hospital. This money is being used for the purpose of supplying small comforts and entertainments to the nurses, officers, and enlisted men that would otherwise not be provided from normal military sources. I have written to the various groups and have thanked them for their gifts. In the letters I failed to tell them that, in addition to things numerated, we have also used part of the money to furnish our library with comfortable reading chairs. We hope to be able to obtain several reading lamps and lounge chairs. When this occurs we should have a very comfortable, inviting room where the staff can go and read in their leisure moments. We were very surprised with the generous response from these various groups and are indeed grateful to them for their thoughtfulness. The amounts received should last us a long time.

We had a rather quiet Christmas and New Year. Colonel Pincoffs came out Christmas Eve and had dinner with us, and then went through the hospital with the various groups as they sang Christmas carols. Each ward was very gaily decorated and we managed to have a tree on each. In addition, we had a large, beautifully decorated, Christmas tree in the mess hall and a special Christmas dinner consisting of turkey and all the traditional "frills." On Christmas Day two movie stars entertained the patients in the afternoon. Some of our patients had built a clever portable stage and puppets, and in the evening they went on to the various wards and entertained the bed patients. It is very difficult to properly appreciate the Christmas spirit in such a climate as this, where we are now in the midst of midsummer weather.

I believe that the holiday season is the most trying to pass without some emotional turmoil; the unit as a whole seems to have done this extremely well.

Please remember me to Mrs. Shipley. I enjoyed the very lovely snow scene on your Christmas card.

Sincerely,
GEORGE H. YEAGER

Capt. Carl D. Clarke, Associate Professor of Art as Applied to Medicine, is now Managing Editor of the Medical Bulletin of the North African Theater of Operations. This publication is distributed by the Army to more than 9000 medical officers in North Africa, Sicily, and Italy to keep them abreast of wartime medicine's latest practices.

The following letter relates some of his experiences in this connection.

4 February, 1944

Dear Friends:

A change of climate and environment seldom makes up for home and familiar faces. The excitement of war does not compensate for the peace of a well ordered existence. My fundamental interests still lie at the University, in the Bulletin and the Department of Art.

Since Mohammed cannot go to the mountain, the mountain must go to Mohammed. Here in North Africa we too have established a medical bulletin patterned in many ways after that of the University. The General is chairman of the Board of Editors and I am managing editor. The other editors are all high-ranking army officers who are most capable in their respective fields. In size and content this Bulletin is slightly larger than that of the University and is issued monthly.

Had I realized the trials and tribulations of such an undertaking in a place plagued by shortages and general uncertainties I am sure the publication would have died before it got its first taste of printer's ink.

After gathering a few worthy articles we prepared the layout, which had to be subjected for approval to a battery of colonels. This was only the beginning. On attempting to obtain paper, zinc, and copper for engraving, I learned that such things were as scarce as ham at a kosher banquet. Finally, I unearthed a French engraver who told me he could make the engravings if I would furnish the chemicals and metal. After much scouring of the countryside, and begging and unraveling red tape, enough of these vital materials were disengorged for the first issue.

The nearest printer, however, could only be found at a distance of 250 miles by air. Back in the States, when our articles were completely edited, I used to say to Mrs. Cohen, employing Walter Winchell's phrase: "Flash! Let's go to press!" I would then drive in my car the one or two miles to the Waverly Press, where I would simply deliver the manuscript into the proper hands. Our worries would be over until the galley proofs were furnished.

Here it is a far different story. After I utter "Flash! Let's go to press!" I must drive ten miles in a command car along a coast line, past numerous battered and sunken ships, and between sheer cliffs of war supplies. Finally I arrive at an airport where transports, bombers, and fighter planes scurry in all directions. I board a plane and travel the 250 miles to the printer in an hour and twenty minutes. Arriving at another airport I drive about twelve miles in a jeep, past radio installations, into a filthy town where Arabs nonchalantly sleep on pavements, in doorways, and even in the gutters. I secure an interpreter and call on the French printer. "Ah, Monsieur, I have no paper and so little ink," he moans. Through the quartermaster I am able to requisition the paper but can obtain no ink. The printer finally agrees to supply the ink, but he leaves me with the impression that I have snatched the last breath of existence out of his very mouth. I leave his shop before he begins to weep, with a silent prayer that the typesetting will be accomplished in due course. I return to my headquarters.

One morning, while busy making a prosthesis for a British soldier who has had his nose separated from his body by a mortar shell, I receive a long distance call; the precious proof has been dispatched by plane and will be delivered at the airport in fifteen minutes. I drop what I am doing, in other words, the soldier's nose, and make a dash for the proof. On examining it my heart sinks, almost causing a diaphragmatic hernia. The type had been set up by a Frenchman without the faintest knowledge of English. Words at the end of lines had been divided without the slightest attention being paid to syllables. They had been capitalized and misspelled as the mood struck the linotype operator. Even the proofreader's marks had been included in the proof. I have to keep the sergeant from his heavy Sunday afternoon date to get the mess straightened out for Monday. Then I make the air trip to the printer again. Once there a stray soldier helps me reread the proof as the final corrections are made. After I have completed the page proof, a most gracious service formerly supplied in the days of peace and sanity by the Waverly Press, the O. K. to let the presses run is given and I sink exhausted into a broken chair to ruminate on my plight. Then, another dash for a plane back to headquarters.

Finally the Bulletin is off the press. This time I must drive 280 surface miles over the mountains to bring the copies back to headquarters. The road winds tortuously around cliffs all the way. The rain has brought large boulders down and at times we have to stop while workmen remove the encumbrances. Some rocks we push aside with the bumper of our command car.

When we start back with our precious burden there is ice on the road, even though this is North Africa. After an exhausting trip we effect the delivery. The General is actually pleased, but I feel as though the child was delivered but the patient almost died in labor.

The next day the Colonel hands me a stack of new manuscripts. I must do the same thing all over again! This time my voice is a little weaker as I turn to the sergeant and sigh: "Flash! Let's go to press!"

Indeed we have been to press.

Sincerely,
CARL D. CLARKE.

Lieut. Col. Lewis P. Gundry, Class of 1928, Assistant Professor of Medicine, is chief of the medical service of the 42nd General Hospital.

Major Arthur G. Siwinski, Class of 1931, Instructor in Surgery, is the receiving and disposition officer.

Major Thomas M. Hutchins, Class of 1939, is serving with the 33rd Surgical Hospital somewhere in the Southwest Pacific. In his two years overseas he has served with his unit in Australia, New Guinea and in his present location. Before being assigned to this unit Major Hutchins served with the 104th Medical Regiment at Fort George G. Meade.

Capt. Jaroslav Hulla, Class of 1925, recently joined the staff of the 42nd General Hospital as physical director. He is to have charge of the physical rehabilitation of convalescent patients.

Capt. Robert T. Pigford, Class of 1940, is on the medical staff of the Walter Reed Hospital in Washington, D. C.

Captain Thompson Pearcy, Class of 1941, is stationed at Camp Ord, California.

Capt. Stephen Magness, Class of 1939, is squadron flight surgeon in a fighter group in the Mediterranean area.

Capt. Samuel White, Class of 1918, is serving with the Fleet's Marine Force in the Pacific.

Lieut. Comdr. Frank M. Hammell, Class of 1932, is stationed at B.O.Q. Unit A-51, Naval Operating Base, Norfolk, Va.

Capt. Theodore A. Schwartz, Class of 1934, Assistant in Rhinology and Laryngology, is in charge of the eye, ear, nose, and throat section of the 42nd General Hospital.

Capt. Schwartz, whose success in removing shell fragments imbedded in eyes and ears has attracted considerable attention, is an extremely busy man both on and off duty. He sponsors and helps edit the post's biweekly paper, *The Stethoscope*, and also manages the post exchange.

Lieut. John Z. Bowers, M.C., U.S.N.R., Class of 1938, is now attached to the Lahey Clinic in Boston for special studies.

Lieutenant Bowers was called to active duty in June, 1941 and sailed for the Pacific on an aircraft carrier after serving at the Norfolk Naval Hospital for several months. Later he was transferred to a destroyer, the U.S.S. *Meredith*, which was sunk by enemy action in October, 1942. Lieutenant Bowers was rescued by a destroyer commanded by Capt. Frederick J. Bell after drifting for three days on a raft in the shark-infested waters of the Solomons.

As a result of his experience Lieutenant Bowers recently received the decoration of the Purple Heart.

A complete account of the sinking of the *Meredith* was written by Lieutenant Bowers and is incorporated in a new book "Condition Red: Destroyer Action in the South Pacific" recently published by Captain Bell.

Lieut. Joshua Warfield Baxley, III

OBITUARIES

LIEUT. JOSHUA WARFIELD BAXLEY, III

Lieut. Joshua Warfield Baxley, III, M.C., U.S.N.R., Class of 1941, was lost in action as a result of the sinking of the *Bristol* in the Mediterranean on October 13, 1943.

The following is part of a letter of tribute written to Mr. and Mrs. Joshua W. Baxley, Jr. by the commanding officer of the *Bristol:*

"Everyone was particularly fond of Josh. His thoughts and acts were honest, and whether one agreed with him or not there was always that feeling that his opinion was a sincere one. This basic sincerity makes good doctors and Josh was just that. When he said 'your illness is nothing' one believed him, and when he said 'you had better get to bed in a hurry' one could bank on something serious. In these days of skepticism and cataclysms it is a great comfort to have someone like Josh.

"He was inherently a healer. Whomever he touched became healthy. His real medical glory was reached in the line of surgery. Once there were many badly wounded men on the *Bristol.* Josh operated continuously for about thirty-six hours. It was a nerve-tearing task, and this was in the combat zone a few hours after combat. During this period he was kind, calm and cheerful. He issued no cross words or sharp commands to those assisting him. And all of his patients pulled through.

"We were proud to have Josh aboard the *Bristol.* He was a competent medical officer and a good shipmate. He lent a hand with many tasks beyond the sphere of his own profession. He tried at all times, and succeeded, in setting an example for everyone. He was militarily smart. His life was in keeping with the traditions of the United States Navy.

"Our percentage of losses was small, due partly to the fortuitous location of the torpedo hit, to the excellently trained condition of the crew in abandoning ship and to the efficient work of the rescue vessels. That Josh should be among those missing is felt keenly by the Navy, his shipmates, and especially by me.

Very sincerely,
J. A. Glick,
Commander, U.S.N."

JOHN PUGH SMALLWOOD, M.D.

Dr. John Pugh Smallwood, a veteran country doctor, died on January 4, 1944 at his home in Falls Church, Va., six days before his seventy-ninth birthday.

Dr. Smallwood had practiced medicine in Fairfax and Arlington Counties for the last thirty-five years. He was a charter member of the Fairfax County Medical Association.

Born in New Bern, N. C., Dr. Smallwood received his early education at Horner's School at Oxford, N. C. He attended the University of Virginia one year and completed his medical training at the University of Maryland in 1885.

Allan, William, Winston-Salem, N. C.; P. & S., class of 1906; served during World War I; shortly before his death had accepted a new post at the Bowman-Gray Medical School in the field of inheritance of diseases, in which he was a pioneer; aged 61; died, March, 1943, of pneumonia.

Barnes, Frank L., Houston, Texas; P. & S., class of 1896; aged 71; died, October 2, 1943, of coronary occlusion.

Beaumont, William B., Laceyville, Pa.; P. & S., class of 1891; aged 78; died, December 22, 1943.

Biddle, Victor, Steubenville, Ohio; P. & S., class of 1909; served during World War I; aged 68; died, October 3, 1943, of angina pectoris.

Boaz, Thomas A., Stoneville, N. C.; P. & S., class of 1892; aged 76; died, January 3, 1944, of uremia.

Briscoe, Beverly Waugh, Addison, Pa.; class of 1903; aged 68; died, September 6, 1943; of heart disease.

Buckner, Leigh, Roanoke, Va.; class of 1885; aged 82; died, December 25, 1943.

Carr, Emory Ward, Lyons, N. Y.; B.M.C., class of 1902; aged 70; died, December 17, 1943, of cerebral thrombosis.

Cohen, Lee, Baltimore, Md.; class of 1895; aged 69; died, December 31, 1943, of carcinoma of the bladder.

Coll, Thomas Lynch, Cambridge, Md.; class of 1909; aged 58; died, January 4, 1944, after an illness of several weeks.

Conner, Chandos Burton, Boston, Mass.; P. & S., class of 1895; aged 69; died, September 15, 1943, of congestive heart disease.

Culbreth, David M. E., Baltimore, Md.; P. & S., class of 1883; aged 87; died, October 20, 1943.

Dwight, Francis Marion, Wedgefield, S. C.; class of 1889; aged 82; died, October 17, 1943.

Green, Leonard Harry, Los Angeles, Calif.; class of 1922; aged 46; died recently.

Hocking, William C., Los Angeles, Calif.; class of 1900; aged 80; died, November 18, 1943, of carcinoma of the stomach.

Holloway, William O., Chappells, S. C.; class of 1899; aged 69; died, December 28, 1943, of coronary thrombosis.

Ikirt, Frank Hasson, East Liverpool, Ohio; B.M.C., class of 1907; aged 69; died, December 6, 1943, of heart disease.

Irwin, Charles Bruce, Chicago, Ill.; class of 1904; aged 62; died, September 21, 1943, of heart disease.

Kerr, Eugene, Baltimore, Md.; class of 1905; aged 72; died, November 21, 1943, of coronary thrombosis.

Mitchell, Frederick William, Houlton, Me.; B.M.C., class of 1898; aged 69; died, September 5, 1943, of Parkinson's disease.

Myers, George Roger, Hurlock, Md.; class of 1902; aged 69; died, October 7, 1943, of cerebral hemorrhage.

Nickel, Harry G., Boiling Springs, Pa.; B.M.C., class of 1898; aged 70; died, October 28, 1943, of coronary occlusion.

Parlett, Roger V., Tucson, Ariz.; class of 1912; served overseas during World War I; aged 55; died, November 6, 1943, of uremia.

Payne, Douglas Amos, Chicago, Ill.; P. & S., class of 1887; aged 86; died, November 24, 1943, of acute cardiac failure caused by decompensated arteriosclerotic myocarditis.

Povey, Harry Clayton, Newark, N. J., B.M.C., class of 1905; aged 59; died, December 10, 1943, of carcinoma of the lung and chronic myocarditis.

Quinn, James Miller, Beckley, W. Va.; B.M.C., class of 1911; aged 55; served as navy surgeon during World War I and was retired with the rank of Lieutenant Commander in 1921; died, January 18, 1944, after an illness of two weeks.

Robbins, Henry B., Jersey City, N. J.; class of 1906; aged 72; died, September 7, 1943, of carcinoma of the liver.

Roberts, John Pierce, Punxsutawney, Pa.; P. & S., class of 1893; aged 75; died, September 27, 1943, of embolism and coronary thrombosis.

Robinson, Benjamin O., Parkersburg, W. Va.; aged 64; died, October 4, 1943, of coronary thrombosis.

Robinson, Isaac Poitevint, Shreveport, La.; B.M.C., class of 1897; aged 82; died, November 25, 1943, of injuries and shock resulting from an automobile accident.

Saliba, Michel M., Wilson, N. C.; B.M.C., class of 1897; served during World War I; aged 68; died, January 5, 1944, in Savannah, Ga., of heart disease and uremia.

Sawyer, Sherwood Dwight, Hilton, N. Y.; B.M.C., class of 1908; aged 65; died, January 11, 1944, of congestive heart disease.

Shoemaker, William Alfred, St. Louis, Mo.; class of 1885; aged 83; died, November 7, 1943, of coronary thrombosis.

Smith, William A., Madison, Va.; class of 1880; aged 88; died, November 10, 1943.

Sperow, William Edgar, Carlisle, Iowa; class of 1894; aged 72; died, November 10, 1943, of heart disease.

Truitt, Charles R., Salisbury, Md.; class of 1891; aged 75; died, September 7, 1943, of chronic myocarditis and chronic diffuse nephritis.

Wilson, Franklin Davis, Norfolk, Va.; class of 1908; aged 61; died, November 17, 1943, of cerebral hemorrhage.

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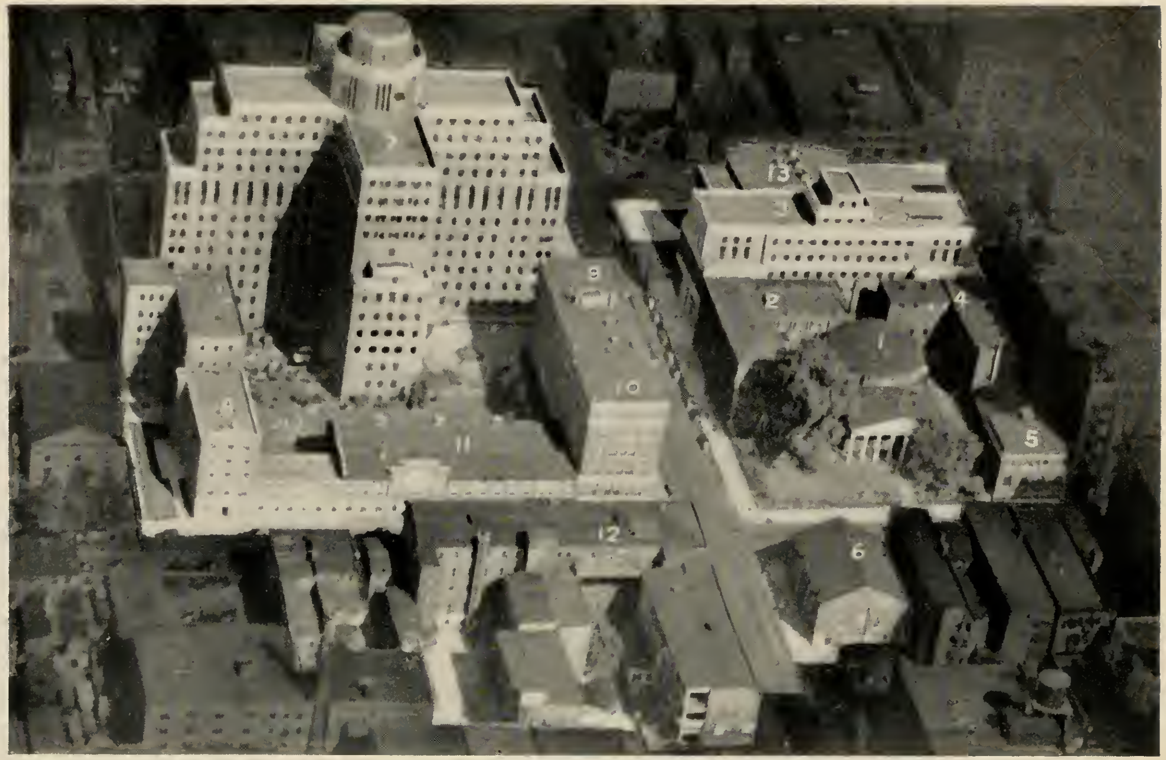

Baltimore Schools—University of Maryland

1. Original Medical Building
2. Laboratory Building, Medicine
3. Bressler Building, Medicine
4. Gray Laboratory, Students' Lounge, Medicine
5. Administration Building, College of Education, Baltimore Division
6. Medical Library
7. University Hospital
8. Nurses' Home, Medicine
9. School of Pharmacy
10. School of Dentistry
11. Dental Clinic
12. Out-Patient Clinics, Medicine
13. School of Law

BULLETIN
OF THE
SCHOOL *of* MEDICINE
UNIVERSITY OF MARYLAND

1807-1856-1920

Announcements

The One Hundred Thirty-seventh Academic Session
April 8, 1943–December 23, 1943

and

The One Hundred Thirty-eighth Academic Session
January 13, 1944–September 29, 1944

Catalogue for Session June 25, 1942–March 23, 1943

SEPTEMBER, 1943

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CALENDAR—ACCELERATED PROGRAM SCHOOL OF MEDICINE

ACADEMIC YEAR—APRIL 8 TO DECEMBER 23, 1943

1943		
March 30, 31	April 1	Re-examinations

FIRST SEMESTER

April 6	Tuesday	*Registration, Freshmen and Sophomores
April 7	Wednesday	*Registration, all other students
April 8	Thursday	Instruction begins
April 23	Friday	Good Friday—Holiday
June 30	Wednesday	Instruction suspended, 5:30 P.M.
July 1 to July 7		Recess—Activation of Army and Navy Units
July 8	Thursday	Instruction resumed
July 31	Saturday	Instruction suspended, 2:00 P.M.
August 2	Monday	Examinations, all classes
to		*Registration, for second semester
August 7	Saturday	First semester completed, 2:00 P.M.
August 9 to August 28		Summer vacation

SECOND SEMESTER

August 30	Monday	Instruction resumed
September 6	Monday	Labor Day—Holiday
November 25	Thursday	Thanksgiving Day—Holiday
November 26	Friday	Instruction resumed
December 4	Saturday	Senior and Junior instruction ends at 2:00 P.M.
December 6	Monday	Senior and Junior examinations begin
December 11	Saturday	Senior examinations completed
		Sophomore and Freshman instruction ends at 12 noon
December 13	Monday	Junior examinations continue
		Sophomore and Freshman examinations begin
December 18	Saturday	Announcement of graduates
		All examinations completed
		Second semester completed, 12:30 P.M.
December 23	Thursday	Graduation, at Baltimore

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* A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars ($5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily, not including Saturday, from 9:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 12:30 p.m.

Early registration is encouraged.

CALENDAR—ACCELERATED PROGRAM
SCHOOL OF MEDICINE

ACADEMIC YEAR—JANUARY 13 TO SEPTEMBER 29, 1944

1944		
January 4, 5, 6		Re-examinations

FIRST SEMESTER

January 11	Tuesday	*Registration, Freshman and Sophomores
January 12	Wednesday	*Registration, all other students
January 13	Thursday	Instruction begins
February 22	Tuesday	Washington's Birthday—Holiday
April 6	Thursday	Instruction suspended 6:00 P.M.
April 7 and 8		Easter Recess
April 10	Monday	Instruction resumed
May 1	Monday	Examinations, all classes, and
to		*Registration for second semester
May 6	Saturday	First semester completed at 2:00 P.M.

SECOND SEMESTER

May 15	Monday	Instruction resumed
May 30	Tuesday	Memorial Day—Holiday
July 4	Tuesday	Independence Day—Holiday
July 29	Saturday	Instruction suspended 2:00 P.M.
August 7 to August 26		Summer vacation
August 28	Monday	Instruction resumed
September 4	Monday	Labor Day—Holiday
September 9	Saturday	Senior and Junior instruction ends 2:00 P.M.
September 11	Monday	Senior and Junior examinations begin
September 16	Saturday	Senior examinations completed Sophomore and Freshmen instruction ends 12 noon
September 18	Monday	Junior examinations continue Sophomore and Freshmen examinations begin
September 23	Saturday	Announcement of graduates All examinations completed Second Semester completed 12:30 P.M.
September 29	Friday	Graduation, at Baltimore

PARTIAL CALENDAR—ACADEMIC YEAR—
OCTOBER 19, 1944 TO JUNE 20, 1945

1944		
October 10, 11, 12		Re-examinations
October 17	Tuesday	*Registration, Freshmen and Sophomores
October 18	Wednesday	*Registration, all other students
October 19	Thursday	Instruction begins

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* A student who fails to register prior to or within the day or days specified will be called upon to pay a late registration fee of five dollars ($5.00). The last day of registration with fee added to regular charges is Saturday of the week in which registration begins.

The offices of the registrar and comptroller are open daily, not including Saturday, from 9:00 a.m. to 5:00 p.m., and Saturday from 9:00 a.m. to 12:30 p.m.

Early registration is encouraged.

ORGANIZATION

THE UNIVERSITY OF MARYLAND

Harry Clifton Byrd, B.S., LL.D., D.Sc., *President and Executive Officer*

BOARD OF REGENTS

	Term Expires
J. Milton Patterson, *Treasurer* 1015 Argonne Drive, Baltimore	1944
Dr. E. Paul Knotts Denton, Md.	1946
Mrs. John L. Whitehurst, *Secretary* 4101 Greenway, Baltimore	1947
Rowland K. Adams, *Chairman* 1808 Fairbank Road, Baltimore	1948
H. H. Nuttle Denton, Md.	1948
William P. Cole, Jr. 201 Varick St., New York, N. Y.	1949
T. Ray Brooks Bel Air, Md.	1950
W. Calvin Chestnut Roland Park, Baltimore	1951
John E. Semmes 100 W. University Parkway, Baltimore	1951
Stanford Z. Rothschild 2215 Kenoak Road, Baltimore	1952

The control of the University of Maryland is assigned to a Board of Regents appointed by the Governor and confirmed by the Senate for terms of nine years each. The general administration of the University is vested in the President. The University Council is an advisory body, composed of the President, the Director of the Agricultural Experiment Station, the Director of the Extension Service, and the Deans. The University Council acts upon all matters having relation to the University as a whole, or to co-operative work between the constituent groups. Each school has its own Faculty Council, composed of the Dean and members of its faculty; each Faculty Council controls the internal affairs of the group it represents.

The University has the following educational organizations:

At Baltimore

- The School of Dentistry
- The School of Law
- The School of Medicine
- The School of Nursing
- The School of Pharmacy

At College Park

- The College of Agriculture
- The College of Arts and Sciences
- The College of Commerce
- The College of Education
- The College of Engineering
- The College of Home Economics
- The Graduate School
- The Department of Military Science and Tactics
- The Department of Physical Education and Recreation
- The Summer School

THE UNIVERSITY SENATE
(Baltimore Schools)

H. C. Byrd, B.S., LL.D., D.Sc.	President of the University
Rob't. U. Patterson, M.D., C.M., LL.D.	Dean of School of Medicine and Superintendent of the Hospital
H. Boyd Wylie, M.D.	Assistant Dean of School of Medicine
Roger Howell, Ph.D., LL.B.	Dean of the School of Law
Andrew G. DuMez, M.S., Ph.D.	Dean of the School of Pharmacy
J. Ben Robinson, D.D.S., F.A.C.D.	Dean of the School of Dentistry
L. B. Broughton, Ph.D.	Dean of the College of Arts and Sciences
Alma H. Preinkert, M.A.	Registrar
Edgar F. Long, Ph.D.	Acting Director of Admissions

FACULTY OF MEDICINE

EMERITI

J. Frank Crouch, M.D.	Professor of Clinical Ophthalmology and Otology, Emeritus
Harry Friedenwald, A.B., M.D., D.H.L., D.Sc.	Professor of Ophthalmology, Emeritus
William S. Gardner, M.D.	Professor of Gynecology, Emeritus
J. M. H. Rowland, M.D., D.Sc., LL.D.	Professor of Obstetrics, Emeritus; Dean, Emeritus

FACULTY BOARD

Rob't. U. Patterson, *Dean*
H. Boyd Wylie, *Assistant Dean*

William R. Amberson
Thomas B. Aycock
Charles Bagley, Jr.
Otto C. Brantigan
Howard M. Bubert
T. Nelson Carey
Ross McC. Chapman
Clyde A. Clapp
Carl L. Davis
Louis H. Douglass
Page Edmunds
Charles Reid Edwards
Frank W. Hachtel
J. Mason Hundley, Jr.
Elliott H. Hutchins
C. Loring Joslin
Edward A. Kitlowski
John C. Krantz, Jr.
Edward A. Looper
Howard J. Maldeis
Zachariah Morgan
Thomas R. O'Rourk
C. W. Peake
H. R. Peters
J. Dawson Reeder
Charles A. Reifschneider
Harry M. Robinson
Milton S. Sacks
Arthur M. Shipley
Irving J. Spear
Hugh R. Spencer
Thomas P. Sprunt
W. Houston Toulson
Eduard Uhlenhuth
Allen Fiske Voshell
Henry J. Walton
Huntington Williams
Walter D. Wise

EXECUTIVE COMMITTEE OF THE FACULTY

Rob't. U. Patterson, *Dean*
H. Boyd Wylie, *Assistant Dean*

Louis H. Douglass
Charles Reid Edwards
Frank W. Hachtel
J. Mason Hundley, Jr.
Arthur M. Shipley
Hugh R. Spencer
Thomas P. Sprunt

FACULTY OF MEDICINE

PROFESSORS

Arthur M. Shipley, M.D., Sc.D., Professor of Surgery.
Hugh R. Spencer, M.D., Professor of Pathology.
H. Boyd Wylie, M.D., Professor of Biological Chemistry and Assistant Dean.
Carl L. Davis, M.D., Professor of Anatomy.
★Maurice C. Pincoffs, B.S., M.D., Professor of Medicine.
Frank W. Hachtel, M.D., Professor of Bacteriology.
Clyde A. Clapp, M.D., Professor of Ophthalmology.
Eduard Uhlenhuth, Ph.D., Professor of Anatomy.
John C. Krantz, Jr., Ph.D., Professor of Pharmacology.
J. Mason Hundley, Jr., M.A., M.D., Professor of Gynecology.
★Walter D. Wise, M.D., Professor of Surgery.
William R. Amberson, Ph.D., Professor of Physiology.
Louis H. Douglass, M.D., Professor of Obstetrics.
Joseph E. Gichner, M.D., Professor of Clinical Medicine and Physical Therapeutics.
Irving J. Spear, M.D., Professor of Neurology.
Charles F. Blake, M.A., M.D., Professor of Diseases of the Rectum and Colon.
[1]§S. Griffith Davis, M.S., M.D., Professor of Anaesthesia.
G. Carroll Lockard, M.D., Professor of Clinical Medicine.
Harvey G. Beck, M.D., D.Sc., Professor of Clinical Medicine.
Albertus Cotton, M.A., M.D., Professor of Orthopaedic Surgery and Roentgenology.
Andrew C. Gillis, M.A., M.D., LL.D., Professor of Neurology.
Henry J. Walton, M.D., Professor of Roentgenology.
Ross McC. Chapman, M.D., Professor of Psychiatry.
Edgar B. Friedenwald, M.D., Professor of Clinical Pediatrics.
Edward A. Looper, M.D., D.Oph., Professor of Rhinology and Laryngology.
[2]§J. W. Downey, M.D., Professor of Otology.
W. H. Toulson, M.Sc., M.D., Professor of Genito-Urinary Surgery.
Charles Bagley, Jr., M.A., M.D., Professor of Neurological Surgery.
Allen Fiske Voshell, A.B., M.D., Professor of Orthopaedic Surgery.
Page Edmunds, M.D., Professor of Traumatic Surgery.
Harry M. Robinson, Sr., M.D., Professor of Dermatology.
Elliott H. Hutchins, M.A., M.D., Professor of Clinical Surgery.
Charles Reid Edwards, M.D., Professor of Clinical Surgery.
‡F. L. Jennings M.D., Professor of Clinical Surgery.
Huntington Williams, M.D., Dr.P.H., Professor of Hygiene and Public Health.
C. Loring Joslin, M.D., Professor of Pediatrics.
★Brice M. Dorsey, D.D.S., Professor of Oral Surgery.
J. Dawson Reeder, M.D., Professor of Diseases of the Rectum and Colon.
Thomas P. Sprunt, A.B., M.D., Professor of Clinical Medicine.

On the lists of the Faculty of Medicine and Fellows and the Hospital and Dispensary staffs are given the names and positions assigned during the sessions June 25, 1942 to March 23, 1943 and April 8, 1943 to December 23, 1943, unless otherwise indicated. Interim changes are noted as follows:

★ On leave, military service.
* Promotions effective during the session April 8, 1943 to December 23, 1943.
† Appointments effective during the session April 8, 1943 to December 23, 1943.
‡ Resignations effective during the session June 25, 1942 to March 23, 1943.
§ Deaths—dates of.
[1] §Died April 21, 1943. [2] §Died November 18, 1941.

Thomas B. Aycock, B.S., M.D., Professor of Clinical Surgery.
★Walter L. Kilby, M.D., Acting Professor of Roentgenology.
Compton Riely, M.D., Clinical Professor of Orthopaedic Surgery.
M. Randolph Kahn, M.D., Clinical Professor of Ophthalmology.
Waitman F. Zinn, M.D., Clinical Professor of Rhinology and Laryngology.
[1]§A. J. Gillis, M.D., Clinical Professor of Genito-Urinary Surgery.
Theodore H. Morrison, M.D., Clinical Professor of Gastro-Enterology.
[2]§Abram S. Samuels, A.B., M.D., Clinical Professor of Gynecology.
H. K. Fleck, M.D., Clinical Professor of Ophthalmology.
★Monte Edwards, M.D., Clinical Professor of Diseases of the Rectum and Colon.
★D. J. Pessagno, A.B., M.D., Clinical Professor of Surgery.
Kenneth D. Legge, M.D., Clinical Professor of Genito-Urinary Surgery.
H. Raymond Peters, A.B., M.D., Clinical Professor of Medicine.
Thomas R. O'Rourk, M.D., Clinical Professor of Otology, Associate in Rhinology and Laryngology and Assistant in Opthalmology.
*Thomas K. Galvin, M.D., Clinical Professor of Gynecology.

ASSOCIATE PROFESSORS

R. W. Locher, M.D., Associate Professor of Clinical Surgery.
T. Nelson Carey, M.D., Associate Professor of Medicine and Physician in Charge of Medical Care of Students.
Howard J. Maldeis, M.D., Associate Professor of Medical Jurisprudence and Associate in Pathology.
[3]§George M. Settle, A.B., M.D., Associate Professor of Neurology and Clinical Medicine.
Thomas R. Chambers, A.B., M.D., Associate Professor of Surgery.
William H. Smith, M.D., Associate Professor of Clinical Medicine.
Paul W. Clough, B.S., M.D., Associate Professor of Medicine.
Sydney R. Miller, B.S., M.D., Associate Professor of Medicine.
J. McFarland Bergland, B.S., M.D., Associate Professor of Obstetrics.
Walter A. Baetjer, A.B., M.D.. Associate Professor of Medicine.
Edward S. Johnson, M.D., Associate Professor of Surgery.
Emil Novak, A.B., M.D., D.Sc., Associate Professor of Obstetrics.
Ralph P. Truitt, M.D., Associate Professor of Psychiatry.
Moses Gellman, B.S., M.D., Associate Professor of Orthopaedic Surgery.
Harry L. Rogers, M.D., Associate Professor of Orthopaedic Surgery.
O. G. Harne, Associate Professor of Histology.
Charles A. Reifschneider, M.D., Associate Professor of Traumatic Surgery and Oral Surgery.
Frank H. J. Figge, Ph.D., Associate Professor of Gross Anatomy.
★Wm. S. Love, Jr., A.B., M.D., Associate Professor of Medicine and Instructor in Pathology.
★Raymond Hussey, M.A., M.D., Associate Professor of Medicine.
★Louis A. M. Krause, M.D., Associate Professor of Medicine.
★N. Clyde Marvel, A.B., M.D., Associate Professor of Surgery.
★T. Campbell Goodwin, M.S., M.D., Associate Professor of Pediatrics.
★Carl Dame Clarke, M.A., Associate Professor of Art as Applied to Medicine.

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[1] §Died February 6, 1943.
[2] §Died February 7, 1943.
[3] §Died September 14, 1942.

Emil G. Schmidt, Ph.D., LL.B., Associate Professor of Biological Chemistry.
Lawrence F. Woolley, M.D., Associate Professor of Psychiatry.
Richard G. Coblentz, M.A., M.D., Associate Professor of Neurological Surgery.
Grant E. Ward, A.B., M.D., Associate Professor of Surgery and Oral Surgery.
Dietrich Conrad Smith, Ph.D., Associate Professor of Physiology.
Franklin B. Anderson, M.D., Associate Professor of Rhinology and Laryngology and Otology.
Leon Freedom, M.D., Associate Professor of Neurology and Instructor in Pathology.
James G. McAlpine, Ph.D., Associate Professor of Bacteriology.
C. Jelleff Carr, Ph.D., Associate Professor of Pharmacology.
Cyrus F. Horine, M.D., Associate Professor of Surgery.
Robert B. Wright, B.S., M.D., Associate Professor of Pathology.
C. Gardner Warner, A.B., M.D., Associate Professor of Pathology.
William E. Hahn, D.D.S., Associate Professor of Oral Surgery.
Vernon D. Kaufman, D.D.S., Associate Professor of Oral Surgery.
†Charles W. Maxson, M.D., Associate Professor of Surgery.
*Robert H. Oster, Ph.D., Associate Professor of Physiology.

ASSISTANT PROFESSORS

George McLean, M.D., Assistant Professor of Medicine.
Maurice Feldman, M.D., Assistant Professor of Gastro-Enterology.
John H. Traband, M.D., Assistant Professor of Pediatrics.
Albert Jaffe, M.D., Assistant Professor of Pediatrics.
★Harry Goldsmith, M.D., Assistant Professor of Psychiatry.
★H. W. Newell, M.D., Assistant Professor of Psychiatry.
Zachariah Morgan, M.D., Assistant Professor of Gastro-Enterology.
★Samuel Morrison, A.B., M.D., Assistant Professor of Gastro-Enterology.
Harry M. Murdock, B.S., M.D., Assistant Professor of Psychiatry.
A. H. Finkelstein, M.D., Assistant Professor of Pediatrics.
John E. Legge, M.D., Assistant Professor of Medicine.
Thomas C. Wolff, Litt.B., M.D., C.M., Assistant Professor of Medicine.
Frederick B. Smith, M.D., Assistant Professor of Pediatrics.
J. G. M. Reese, M.D., Assistant Professor of Obstetrics.
M. Alexander Novey, A.B., M.D., Assistant Professor of Obstetrics.
Leo Brady, A.B., M.D., Assistant Professor of Gynecology.
George A. Strauss, Jr., M.D., Assistant Professor of Gynecology.
H. M. Bubert, M.D., Assistant Professor of Medicine.
★Walter C. Merkel, A.B., M.D., Assistant Professor of Pathology.
John F. Lutz, A.B., M.D., Assistant Professor of Histology.
Benjamin Pushkin, M.D., Assistant Professor of Neurology.
William Ellsworth Evans, Ph.D., Assistant Professor of Pharmacology.
H. F. Bongardt, M.D., Assistant Professor of Surgery.
J. Edmund Bradley, B.S., M.D., Assistant Professor of Pediatrics.
★George H. Yeager, B.S., M.D., Assistant Professor of Surgery.
Isadore A. Siegel, A.B., M.D., Assistant Professor of Obstetrics.
William H. F. Warthen, A.B., M.D., Assistant Professor of Hygiene and Public Health.
Francis Ellis, A.B., M.D., Assistant Professor of Dermatology.
Edward P. Smith, M.D., Ph.G., Assistant Professor of Gynecology.
J. S. Eastland, A.B., M.D., Assistant Professor of Medicine.
★Henry F. Ullrich, M.D., D.Sc., Assistant Professor of Orthopaedic Surgery.

★D. James Greiner, B.S., M.D., Assistant Professor of Pathology.
‡James C. Plagge, Ph.D., Assistant Professor of Gross Anatomy.
Milton S. Sacks, B.S., M.D., Assistant Professor of Medicine, Instructor in Pathology.
Ross Davies, M.D., M.P.H., Assistant Professor of Hygiene and Public Health.
J. Herbert Wilkerson, M.D., Assistant Professor of Oral Surgery.
★Lewis P. Gundry, A.B., M.D., Assistant Professor of Medicine.
Henry F. Graff, A.B., M.D., Assistant Professor of Ophthamology.
Walter L. Hard, A.B., Ph.D., Assistant Professor of Histology.
Glenn S. Weiland, Ph.D., Assistant Professor of Biological Chemistry.
Otto C. Brantigan, B.S., M.D., *Assistant Professor of Gross Anatomy, Associate in Surgery.
†F. Gaynor Evans, A.B., Ph.D., Assistant Professor of Gross Anatomy.
[2]†Rubert S. Anderson, B.S., Ph.D., Assistant Professor of Physiology.

LECTURERS

Jonas Friedenwald, M.A., M.D., Lecturer in Ophthalmic Pathology.
[1]§E. B. Freeman, B.S., M.D., Lecturer in Medicine.
Charles R. Goldsborough, M.A., M.D., Lecturer in Medicine.
W. N. Bispham, Col., M.C., U. S. A. (ret.), Lecturer in Medicine
Leslie B. Hohman, M.D., Lecturer in Psychiatry.
Clark H. Yeager, M.D., Dr.P.H., Lecturer in Tropical Medicine.

ASSOCIATES

John R. Abercrombie, A.B., M.D., Associate in Dermatology.
Joseph I. Kemler, M.D., Associate in Ophthalmology.
Frank N. Ogden, M.D., Associate in Biological Chemistry.
Austin H. Wood, M.D., Associate in Genito-Urinary Surgery.
Albert E. Goldstein, M.D., Associate in Pathology.
Samuel S. Glick, M.D., Associate in Pediatrics.
Clewell Howell, B.S., M.D., Associate in Pediatrics.
Joseph Sindler, M.D., Associate in Gastro-Enterology.
I. O. Ridgley, M.S., M.D., Associate in Surgery.
L. J. Millan, M.D., Associate in Genito-Urinary Surgery.
W. Raymond McKenzie, M.D., Associate in Rhinology and Laryngology.
L. K. Fargo, M.D., Associate in Genito-Urinary Surgery.
Wetherbee Fort, M.D., Associate in Medicine.
[2]§F. Stratner Orem, M.D., Associate in Pediatrics.
Frank J. Geraghty, A.B., M.D., Associate in Medicine.
John F. Hogan, M.D., Associate in Genito-Urinary Surgery.
★Kenneth B. Boyd, M.D., Associate in Gynecology and Assistant in Obstetrics.
John T. Hibbitts, M.D., Associate in Gynecology.
E. H. Tonolla, M.D., Associate in Medicine.
C. W. Peake, M.D., Associate in Surgery.
W. A. H. Councill, M.D., Associate in Genito-Urinary Surgery.
Z. Vance Hooper, M.D., Associate in Gastro-Enterology.
Frank B. Kindell, A.B., M.D., Associate in Pathology.

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‡ Resigned August 31, 1943.
[1]†Appointed September 1, 1943.
[2] Appointed October 1, 1943.
[1]§Died December 23, 1942.
[2]§Died August 8, 1943.

William M. Seabold, A.B., M.D., Associate in Pediatrics.
Benjamin S. Rich, A.B., M.D., Associate in Otology and in Rhinology and Laryngology.
★John E. Savage, B.S., M.D., Associate in Obstetrics.
[1]§★Thomas J. Coonan, A.B., M.D., Associate in Pediatrics.
E. Eugene Covington, M.D., Associate in Surgery and †Gross Anatomy.
Edward A. Kitlowski, M.D., Associate in Plastic Surgery.
G. Bowers Mansdorfer, B.S., M.D., Associate in Pediatrics.
Sol Smith, M.D., Associate in Medicine.
★Henry V. Langeluttig, A.B., M.D., Associate in Medicine.
James W. Nelson, M.D., Associate in Surgery.
★I. Ridgeway Trimble, M.D., Associate in Surgery.
★Richard T. Shackelford, A.B., M.D., Associate in Surgery.
★Simon H. Brager, M.D., Associate in Surgery.
Raymond F. Helfrich, A.B., M.D., Associate in Surgery.
★Harry S. Shelley, B.S., M.D., Associate in Genito-Urinary Surgery.
★Harry C. Hull, M.D., Associate in Surgery.
★Harry M. Robinson, Jr., B.S., M.D., Associate in Dermatology, Assistant in Medicine.
Francis W. Gillis, M.D., Associate in Genito-Urinary Surgery.
John C. Dumler, B.S., M.D., Associate in Gynecology.
Beverley C. Compton, A.B., M.D., Associate in Gynecology.
Houston Everett, M.D., Associate in Gynecology.
Margaret B. Ballard, M.D., Associate in Obstetrics.
Dudley P. Bowe, A.B., M.D., Associate in Obstetrics.
Cleo D. Stiles, M.D., Associate in Rhinology and Laryngology, and Assistant in Otology.
Charles N. Davidson, M.D., Associate in Roentgenology.
F. Edwin Knowles, Jr., M.D., Associate in Ophthalmology.

INSTRUCTORS

★Henry F. Buettner, M.D., Instructor in Bacteriology.
‡M. S. Koppelman, M.D., Instructor in Gastro-Enterology.
Myron G. Tull, A.B., M.D., Instructor in Hygiene and Public Health.
William R. Johnson, M.D., Instructor in Surgery.
E. M. Hanrahan, A.B., M.D., Instructor in Surgery.
Ruth Musser, M.S., Instructor in Pharmacology.
‡Benjamin Abeshouse, Ph.B., M.D., Instructor in Pathology.
S. Demarco, M.D., Instructor in Surgery.
★Karl J. Steinmueller, A.B., M.D., Instructor in Surgery.
★Samuel T. Helms, B.S., M.D., Instructor in Medicine and Genito-Urinary Surgery.
★F. A. Holden, M.D., Instructor in Ophthalmology.
‡Earl L. Chambers, M.D., Instructor in Medicine.
★M. Paul Byerly, M.D., Instructor in Pediatrics.
Luther E. Little, M.D., Instructor in Surgery.
J. Frank Hewitt, A.B., M.D., Instructor in Surgery.
David Tenner, M.D., Instructor in Medicine.
★R. B. Mitchell, Jr., B.S., M.D., Instructor in Medicine.
Samuel Legum, A.B., M.D., Instructor in Medicine.
‡Ernest Levi, M.D., Instructor in Gastro-Enterology.

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[1] §Died November 3, 1942.

Ernest S. Edlow, A.B., M.D., Instructor in Gynecology.
Thomas S. Bowyer, A.B., M.D., Instructor in Gynecology and †Assistant in Obstetrics.
M. S. Shiling, A.B., M.D., D.Sc., Instructor in Medicine.
‡Robert W. Garis, A.B., M.D., Instructor in Medicine.
Philip F. Lerner, A.B., M.D., Instructor in Neurology.
H. Edmund Levin, B.S., M.D., Instructor in Medicine and Bacteriology.
★Conrad B. Acton, B.S., M.D., Instructor in Medicine and Assistant in Pathology.
Robert A. Reiter, A.B., M.D., Instructor in Medicine.
W. Grafton Hersperger, A.B., M.D., Instructor in Medicine.
Meyer W. Jacobson, M.D., Instructor in Medicine.
★Hugh G. Whitehead, M.D., Instructor in Medicine.
★Philip D. Flynn, M.D., Instructor in Medicine.
Albert J. Shochat, B.S., M.D., Instructor in Gastro-Enterology.
★Jerome Fineman, M.D., Instructor in Pediatrics.
‡Bernhard Badt, M.D., Instructor in Neurology.
★William L. Fearing, M.D., Instructor in Neurology.
★Frank K. Morris, A.B., M.D., Instructor in Gynecology and Obstetrics.
★B. Matthew Debuskey, M.D., Instructor in Pediatrics.
★A. Russell Anderson, M.D., Instructor in Psychiatry.
‡James C. Owings, M.D., Instructor in Diseases of the Rectum and Colon.
★Edward S. Kallins, B.S., M.D., Instructor in Medicine.
W. Allen Deckert, A.B., M.D., Instructor in Gynecology and Assistant in Surgery and Obstetrics.
★Murray M. Copeland, M.D., Instructor in Surgery.
J. Duer Moores, B.S., M.D., Instructor in Surgery.
★Philip S. Wagner, M.D., Instructor in Psychiatry.
★Irving Freeman, B.S., M.D., Instructor in Medicine.
Hugh B. McNally, B.S., M.D., Instructor in Obstetrics.
John A. Myers, M.E.E., M.D., Instructor in Medicine, Assistant in Gastro-Enterology.
★Edward F. Cotter, M.D., Instructor in Pathology, Assistant in Neurology.
Kurt Levy, M.D., Instructor in Medicine.
Thurston R. Adams, M.D., Instructor in Gross Anatomy, Surgery and Diseases of the Rectum and Colon.
Henry L. Wollenweber, M.D., Instructor in Pathology, †Assistant in Pharmacology.
★William G. Helfrich, B.S., M.D., Instructor in Medicine.
★Howard B. Mays, M.D., Instructor in Genito-Urinary Surgery and Assistant in Pathology.
★Arthur G. Siwinski, A.B., M.D., Instructor in Surgery.
★Lester N. Kolman, M.D., Instructor in Dermatology.
★Gibson J. Wells, A.B., M.D., Instructor in Pediatrics.
★Harry A. Teitelbaum, B.S., M.D., Instructor in Gross Anatomy, Assistant in Neurology.
★Ernest I. Cornbrooks, Jr., A.B., M.D., Instructor in Gynecology.
★Francis G. Dickey, A.B., M.D., Instructor in Medicine.
★Herbert E. Reifschneider, A.B., M.D., Instructor in Oral Surgery and Assistant in Surgery.
James E. P. Toman, A.B., Ph.D., Instructor in Physiology.
William B. Settle, M.D., Instructor in Gynecology, †Assistant in Gross Anatomy.
Robert L. Graham, A.B., M.D., Instructor in Pathology.
Conrad L. Inman, D.D.S., Instructor in Oral Surgery.
★B. Wallace Inman, D.D.S., Instructor in Oral Surgery.

Dorsey R. Tipton, D.D.S., Instructor in Oral Surgery.
I. H. Maseritz, M.D., Instructor in Orthopaedic Surgery.
Milton C. Lang, M.D., Instructor in Ophthalmology.
C. Edward Leach, M. D., Instructor in Medicine.
‡David Hollander, A.B., M.D., Instructor in Pathology.
‡Edward G. Boettiger, Ph.D., Instructor in Physiology.
John A. Wagner, M.D., Instructor in Pathology.
A. Kremen, A.B., M.D., Instructor in Opthalmology.
Lawrence M. Serra, M.D., Instructor in Medicine.
Charles Schmidt, M.D., Instructor in Psychiatry.
‡Wilson Grubb, M.D., Instructor in Pediatrics.
Ann Virginia Brown, A.B., Instructor in Biological Chemistry.
James G. Arnold, Jr., M.D., Instructor in Neurological Surgery.
Calvin Hyman, M.D., Instructor in Surgery.
†W. W. Walker, M.D., Instructor in Gross Anatomy and Surgery
*Joye E. Jacobs, A.B., Instructor in Physiology.
†Hans W. Loewald, M.D., Instructor in Psychiatry.
†Marie A. Andersch, B.S., M.S., Ph.D., Instructor in Medicine
†William K. Diehl, B.S., M.D., Instructor in Gynecology.
*Vernon E. Krahl, B.S., M.S., Instructor in Gross Anatomy.
†Frederic A. Glass, M.D., Instructor in Dermatology.

ASSISTANTS

William R. Geraghty, B.S., M.D., Assistant in Surgery.
★Jaroslav Hulla, M.D., Assistant in Obstetrics.
‡Marius P. Johnson, A.B., M.D., Assistant in Pharmacology.
Howard B. McElwain, M.D., Assistant in Surgery.
A. V. Buchness, A.B., M.D., Assistant in Surgery.
T. J. Touhey, M.D., Assistant in Surgery.
W. J. Schmitz, M.D., Assistant in Pediatrics.
Clyde F. Karns, B.S., M.D., Assistant in Surgery.
Morris Fine, M.D., Assistant in Medicine.
Samuel H. Culver, M.D., Assistant in Surgery.
★W. H. Triplett, M.D., Assistant in Medicine.
E. Hollister Davis, A.B., M.D., Assistant in Anaesthesia.
★Israel P. Meranski, B.S., M.D., Assistant in Pediatrics.
Albert R. Wilkerson, M.D., Assistant in Surgery.
[1]§H. Whitney Wheaton, M.D., Assistant in Pediatrics.
★Lauriston L. Keown, A.B., M.D., Assistant in Pediatrics.
L. T. Chance, M.D., Assistant in Surgery.
Samuel McLanahan, Jr., A.B., M.D., Assistant in Surgery.
★Samuel E. Proctor, A.B., M.D., Assistant in Surgery.
George Govatos, A.B., M.D., Assistant in Surgery.
Jerome Snyder, B.S., M.D., Assistant in Ophthalmology.
William H. Grenzer, M.D., Assistant in Medicine.
★George Silverton, A.B., M.D., Assistant in Medicine.
Dwight M. Currie, A.B., M.D., Assistant in Surgery.
Rollin C. Hudson, M.D., Assistant in Dermatology.

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[1] §Died April 24, 1943.

Maxwell L. Mazer, M.D., Assistant in Obstetrics.
★Joseph M. Blumberg, B.S., M.D., Assistant in Medicine and Obstetrics.
★Ferd. E. Kadan, A.B., M.D., Assistant in Obstetrics.
★Lawrence Katzenstein, M.D., Assistant in Medicine.
Leon Ashman, M.D., Assistant in Medicine.
Nathaniel M. Beck, A.B., M.D., Assistant in Medicine and Gastro-Enterology.
Robert F. Healy, M.D., Assistant in Surgery.
Herbert M. Foster, M.D., Assistant in Surgery.
★Daniel R. Robinson, M.D., Assistant in Surgery.
★H. L. Granoff, A.B., M.D., Assistant in Gynecology.
J. J. Erwin, M.D., Assistant in Gynecology.
‡Israel Rosen, A.B., M.D., Assistant in Pediatrics.
‡William Greenfeld, M.D., Assistant in Gastro-Enterology.
★S. Edwin Muller, M.D., Assistant in Medicine.
Samuel Snyder, M.D., Assistant in Medicine.
★Paul E. Carliner, B.S., M.D., Assistant in Medicine.
★William A. Parr, M.D., Assistant in Otology.
Jeannette R. Heghinian, B.S., M.D., Assistant in Dermatology.
★Joseph V. Jerardi, B.S., M.D., Assistant in Surgery.
Robert F. Chenowith, M.D., Assistant in Surgery.
★Jacob R. Jensen, B.S., M.D., Assistant in Obstetrics.
J. Edward Norris, M.D., Assistant in Obstetrics.
★J. Warren Albrittain, B.S., M.D., Assistant in Obstetrics.
★Karl F. Mech, B.S., M.D., Assistant in Pathology.
Louis J. Kroll, A.B., M.D., Assistant in Medicine.
★Samuel T. R. Revell, B.S., M.D., Assistant in Medicine.
★Hugh Jewett, M.D., Assistant in Genito-Urinary Surgery.
John V. Hopkins, M.D., Assistant in Orthopaedic Surgery.
★John L. Atkins, A.B., M.D., Assistant in Medicine.
★John W. Machen, M.D., Assistant in Neurology.
Donald B. Grove, M.D., Assistant in Surgery.
★William S. Cheney, M.D., Assistant in Surgery.
George H. Davis, M.D., Assistant in Obstetrics.
F. A. Kayser, M.D., Assistant in Rhinology and Laryngology.
★Theodore A. Schwartz, M.D., Assistant in Rhinology and Laryngology.
★Harry C. Bowie, B.S., M.D., Assistant in Surgery and Gross Anatomy.
D. McClelland Dixon, M.D., Assistant in Obstetrics and Pathology.
★Ephraim T. Lisansky, A.B., M.D., Assistant in Pathology and Medicine.
★William K. Waller, A.B., M.D., Assistant in Medicine.
‡Robert J. Gore, M.D., Assistant in Pediatrics.
★Earle S. Scott, M.D., Assistant in Pediatrics.
★Nachman Davidson, A.B., M.D., Assistant in Medicine.
★William M. Garlick, A.B., M.D., Assistant in Surgery.
★George H. Brouillet, B.S., M.D., Assistant in Surgery.
★Benjamin Highstein, M.D., Assistant in Dermatology.
★Mark Hollander, M.D., Assistant in Dermatology.
★W. Kenneth Mansfield, Jr., M.D., Assistant in Obstetrics.
Bernard W. Donahue, M.D., Assistant in Obstetrics.
Arnold F. Lavenstein, M.D., Assistant in Pediatrics.
William Earl Weeks, M.D., Assistant in Pediatrics.
★†Donald J. Roop, M.D., Assistant in Medicine.

Leslie Harrell Pierce, B.S., M.D., Assistant in Medicine.
★H. Pearce Maccubbin, B.S., M.D., Assistant in Medicine.
Wilfred H. Townshend, Jr., A.B., M.D., Assistant in Medicine.
★Edward L. Frey, Jr., A.B., M.D., Assistant in Medicine.
William C. Lowe, B.S., M.D., Assistant in Medicine.
Thomas A. Hedrick, M.D., Assistant in ‡Medicine and Pediatrics.
★Frederick W. Waknitz, M.D., Assistant in Surgery.
★Clarence P. Scarborough, M.D., Assistant in Surgery.
★William C. Humphries, M.D., Assistant in Rhinology and Laryngology.
Solomon Tanenbaum, M.D., Assistant in Dermatology.
Jason H. Gaskell, M.D., Assistant in Orthopedic Surgery.
Richard S. Owens, M.D., Assistant in Otology.
Harold H. Burns, M.D., Assistant in Surgery.
★Daniel I. Dann, M.D., Assistant in Obstetrics.
D. Frank Kaltreider, M.D., Assistant in Obstetrics.
Helen I. Maginnis, M.D., Assistant in Gynecology.
★Arthur Karfgin, B.S., M.D., Assistant in Medicine.
★Joseph E. Muse, Jr., B.S., M.D., Assistant in Medicine.
Daniel Wilfson, Jr., A.B., M.D., Assistant in Medicine.
★Joseph B. Gross, B.S., M.D., Assistant in Medicine.
Samuel J. Hankin, M.D., Assistant in Medicine.
Anthony F. Carozza, M. D., Assistant in Medicine.
★Stuart G. Coughlan, B.S., M.D., Assistant in Surgery.
★William B. Long, Jr., B.S., M.D., Assistant in Orthopaedic Surgery.
Charles H. Doeller, Jr., A.B., M.D., Assistant in Obstetrics.
★Robert C. Crawford, A.B., M.D., Assistant in Medicine.
★Everett S. Diggs, B.S., M.D., Assistant in Gynecology.
★Charles W. Knerler, M.D., Assistant in Medicine.
★Ernest W. Mack, M.D., Assistant in Surgery.
★Hugh H. Trout, Jr., M.D., Assistant in Surgery.
★Marion H. Gillis, M.D., Assistant in Ophthalmology.
★Charles W. Reavis, M.D. Assistant in Roentgenology.
★Henry L. Rigdon, M.D., Assistant in Surgery.
★Oliver A. James, M.D., Assistant in Surgery.
★J. King B. E. Seegar, Jr., A.B., M.D., Assistant in Obstetrics.
★Edwin O. Daue, Jr., B.S., M.D., Assistant in Medicine.
★Robert L. Gibbs, A.B., M.D., Assistant in Medicine.
★James R. Karns, B.S., M.D., Assistant in Medicine.
★Robert B. Mearns, M.D., Assistant in Medicine.
★William W. McKinney, M.D., Assistant in Neurological Surgery.
Benedict Skitarelic, A.B., M.D., Assistant in Pathology and †Medicine.
★†William H. Kammer, Jr., A.B., M.D., Assistant in Medicine.
★† John F. Schaeffer, B.S., M.D., Assistant in Surgery.
★†Howard F. Kinnamon, Jr., M.D., Assistant in Surgery.
†Robert D. Duncan, M.D., Assistant in Gross Anatomy and Surgery.
★†L. Calvin Gareis, B.S., M.D., Assistant in Obstetrics.
†Richard L. Goyne, B.S., M.D., Assistant in Obstetrics.
†Schuyler G. Kohn, B.S., M.D., Assistant in Obstetrics.
†Thomas E. Russell, B.S., M.D., Assistant in Obstetrics.
†John H. Morrison, B.S., M.D., Assistant in Obstetrics.
★†John D. Rosin, B.S., M.D., Assistant in Obstetrics.

†Mary E. Chinn, A.B., Assistant in Physiology.
†L. Ann Hellen, B.S., Assistant in Medicine.
†Edward G. Jones, A.B., M.D., Assistant in Gynecology.
†Morris A. Fine, M.D., Assistant in Genito-Urinary Surgery.
†Frederick T. Kyper, M.D., Sc.D., Assistant in Rhinology and Laryngology.
†Samuel L. Fox, M.D., Assistant in Rhinology and Laryngology.

FELLOWS AND RESEARCH ASSOCIATES

Frederick K. Bell, Ph.D., U. S. Pharmacopoeia Fellow.
‡Sylvan E. Forman, Ph.D., Fellow in Pharmacology.
★‡Sidney Berman, M.D., Fellow in Psychiatry.
★Frederick J. Vollmer, B.S., M.D., Hitchcock Fellow in Medicine.
★Harry C. Bowie, B.S., M.D., Weaver Fellow in Gross Anatomy.
‡Guy M. Everett, B.S., Weaver Fellow in Physiology.
John A. Wagner, B.S., M.D., Hitchcock Fellow in Neurosurgery.
†William K. Diehl, B.S., M.D., Hitchcock Fellow in Gynecology.
‡Dexter L. Reimann, B.S., M.D., Weaver Fellow in Pathology.
‡Ruth M. Bishop, A.B., Fellow in Pharmacology.
Edith J. Wiegand, A.B., M.S., Fellow in Pharmacology.
Milton L. Solomon, B.S., M.D., Research Associate in Gross Anatomy.
†Jane Louise Banker, A.B., Weaver Fellow in Biochemistry.
†C. Martin Rhode, A.B., M.D., Weaver Fellow in Physiology.
†Leslie Harrell Pierce, B.S., M.D., Hitchcock Fellow in Medicine.
†Dorothy Kibler, M.S., Fellow in Pharmacology.
†Dorothy Bizzell, American Philosophical Society Fellow in Physiology.

UNIVERSITY HOSPITAL

EXECUTIVE COMMITTEE OF THE STAFF

Rob't. U. Patterson, *Superintendent*
Vergil F. Bradfield, *Assistant Superintendent*

Thomas P. Sprunt, *Chairman*
Arthur M. Shipley
Louis H. Douglass
J. Mason Hundley, Jr.
Clyde A. Clapp
Edward A. Looper
Henry J. Walton
C. Loring Joslin
William M. Seabold, *Secretary*

Alternates
T. Nelson Carey
Charles Reid Edwards
J. G. M. Reese
Beverley C. Compton
Henry F. Graff
Thomas R. O'Rourk
Charles N. Davidson
J. Edmund Bradley

UNIVERSITY HOSPITAL STAFF

Rob't. U. Patterson, *Superintendent*
Vergil F. Bradfield, *Assistant Superintendent*

Physician-in-Chief	★Maurice C. Pincoffs
Acting Physician-in-Chief	Thomas P. Sprunt
Physicians	Walter A. Baetjer Thomas P. Sprunt John E. Legge ★Louis A. M. Krause G. Carroll Lockard Joseph E. Gichner William H. Smith ★William S. Love, Jr. T. Nelson Carey ★Raymond Hussey
Gastro-Enterologist	Zachariah R. Morgan
Neurologists	Irving J. Spear §George M. Settle Leon Freedom
Psychiatrists	Ross McC. Chapman Ralph P. Truitt Harry M. Murdock
Pediatricians	C. Loring Joslin Albert Jaffe J. Edmund Bradley
Pathologist	Hugh R. Spencer
Surgeon-in-Chief	Arthur M. Shipley
Surgeons	Charles Reid Edwards Page Edmunds Thomas B. Aycock

Neurological Surgeons	Charles Bagley, Jr. Richard G. Coblentz
Laryngologists	Edward A. Looper Franklin B. Anderson Thomas R. O'Rourk
Proctologists	J. Dawson Reeder ★Monte Edwards
Orthopaedic Surgeons	Allen Fiske Voshell Moses Gellman Compton Riely ★Henry F. Ullrich
Genito-Urinary Surgeons	W. H. Toulson W. A. H. Councill Lyle J. Millan ★Harry S. Shelley ★Howard B. Mays
Roentgenologists	Henry J. Walton ★Walter L. Kilby Charles N. Davidson
Dermatologist	Harry M. Robinson, Sr.
Bronchoscopist	Edward A. Looper
Otologist	§J. W. Downey, Jr.
Anaesthetists	§S. Griffith Davis E. Hollister Davis Mary J. O'Brien, R.N. Ruth Elliott, R.N. Rose L. Furlong, R.N.
Obstetricians	Louis H. Douglass M. A. Novey Isadore A. Siegel J. G. M. Reese ★John E. Savage
Ophthalmologists	Clyde A. Clapp William Tarun Henry F. Graff
Gynecologists	J. Mason Hundley, Jr. Leo Brady Beverley C. Compton
Oncologists	J. Mason Hundley, Jr. Grant E. Ward

ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments are made to the University Hospital:

Seven Residents in Surgery
Four Residents in Medicine
Four Residents in Obstetrics
Three Residents in Gynecology
Two Residents in Pediatrics
Resident in Nose and Throat
Two Residents in Roentgenology
Twenty-five rotating Interns

UNIVERSITY HOSPITAL RESIDENT AND INTERN STAFF

JULY 1, 1942 - JUNE 30, 1943

RESIDENT STAFF

Robert C. Sheppard, Ph.G., M.D., *Resident Surgeon.*
Henry A. Briele, M.D., *First Assistant Resident Surgeon.*
Raymond M. Cunningham, A.B., M.D., *Assistant Resident Surgeon.*
William H. Fisher, M.D., *Assistant Resident Surgeon.*
Forest C. Meade, M.D., *Assistant Resident Surgeon.*
Richard T. Williams, A.B., M.D., *Assistant Resident Surgeon.*
William H. Leitch, B.S., M.D., *Assistant Resident Surgeon.*
★Averill Stowell, M.D., *Assistant Resident Surgeon, assigned to Neurosurgery.*
Frederick T. Kyper, M.D., Sc.D., *Resident in Otorhinolaryngology.*
Leslie Harrell Pierce, B.S., M.D., *Resident Physician.*
Wilfred H. Townshend, Jr., A.B., M.D., *Assistant Resident Physician.*
★H. Pearce Maccubbin, B.S., M.D., *Assistant Resident Physician.*
Richard L. Goyne, B.S., M.D., *Resident Obstetrician.*
John T. Cole, A.B., M.D., *Assistant Resident Obstetrician.*
Schuyler G. Kohn, B.S., M.D., *Assistant Resident Obstetrician.*
George H. Davis, B.S., M.D., *Assistant Resident Obstetrician.*
★Roland E. Bieren, M.D., *Resident Gynecologist.*
Edward G. Jones, A.B., M.D., *Assistant Resident Gynecologist.*
Benjamin H. Inloes, Jr., M.D., *Assistant Resident Gynecologist.*
James J. McCort, A.B., M.D., *Resident Roentgenologist.*
Arnold F. Lavenstein, A.B., M.D., *Resident Pediatrician.*
William E. Weeks, B.S., M.D., *Assistant Resident Pediatrician.*

SENIOR INTERNS

Margaret V. Palmer, M.A., M.D.
Edwin L. Seigman, A.B., M.D.
Raymond K. Thompson, B.S., M.D.
[1]Thomas C. Wilder, M.D.
Elizabeth B. Sherrill, B.S., M.D.

JUNIOR INTERNS

★Van B. Bennett, A.B., M.D.
Joseph G. Bird, B.S., M.D.
Robert A. Barthel, Jr., B.S., M.D.
William L. Byerly, Jr., B.S., M.D.
★Richard A. Carey, B.S., M.D.
★John H. Franz, A.B., M.D.
Theodore Kardash, B.S., M.D.
Etta C. Link, B.S., M.D.
★Louis O. Manganiello, A.B., M.D.
★William T. Raby, B.S., M.D.
★John D. Rosin, A.B., M.D.
Edgar R. Shipley, A.B., M.D.

DENTAL INTERN

★Glenn Steele, D.D.S.

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[1] July 1, 1942 to September 30, 1942.

ANNOUNCEMENT OF UNIVERSITY HOSPITAL RESIDENT AND INTERN STAFF

RESIDENT STAFF

JULY 1, 1943 TO JUNE 30, 1944

Henry A. Briele, M.D., *Resident Surgeon.*
William H. Fisher, M.D., *Assistant Resident Surgeon.*
William H. Leitch, B.S., M.D., *Assistant Resident Surgeon.*
Forest C. Meade, M.D., *Assistant Resident Surgeon.*
Richard T. Williams, A.B., M.D., *Assistant Resident Surgeon.*
Edgar R. Shipley, A.B., M.D., *Assistant Resident Surgeon.*
Exie Mildred Gregory, M.D., *Assistant Resident Surgeon.*
Raymond K. Thompson, B.S., M.D., *Resident Neurosurgeon.*
Wilfred H. Townshend, Jr., A.B., M.D., *Resident Physician.*
Margaret V. Palmer, M.A., M.D., *Assistant Resident Physician.*
Joseph G. Bird, B.S., M.D., *Assistant Resident Physician.*
George H. Davis, B.S., M.D., *Resident Obstetrician.*
Schuyler G. Kohn, B.S., M.D., *Resident Obstetrician.*
John H. Morrison, B.S., M.D., *Assistant Resident Obstetrician.*
★John D. Rosin, A.B., M.D., *Assistant Resident Obstetrician.*
Edward G. Jones, A.B., M.D., *Resident Gynecologist.*
Benjamin H. Inloes, Jr., M.D., *Assistant Resident Gynecologist.*
Theodore Kardash, B.S., M.D., *Assistant Resident Gynecologist.*
William E. Weeks, B.S., M.D., *Assistant Resident Pediatrician.*
Thomas A. Hedrick, M.D., *Assistant Resident Pediatrician.*

INTERNS

APRIL 1, 1943 TO MARCH 31, 1944

James W. Bizzell, B.S., M.D.
Ralph S. Chenowith, Ph.G., M.D.
Harry Cohen, B.S., M.D.
Thomas B. Dunne, A.B., M.D.
John W. Epperson, B.S., M.D.
Samuel L. French, A.B., M.D.
William B. Hagan, B.S., M.D.
Alvin H. Honigman B.S., M.D.
William J. Hunt, B.S., M.D.
William R. Jenkins, B.S., M.D.
Robert F. Keadle, B.S., M.D.
Lemuel W. Kornegay, Jr., B.S., M.D.
Marcy E. McMillan, Jr., A.B., M.D.
Frank S. Parrott, B.S., M.D.
Raymond V. Rangle, B.S., M.D.
Josephine E. Renshaw, B.S., M.D.
Granville H. Richards, Jr., A.B., M.D.
Francis Frederick Ruzicka, Jr., A.B., M.D.
Edwin H. Stewart, Jr., M.D.
Thomas L. Wilson, M.D.
David K. Worgan, B.S., M.D.

Sybil Corbett, B.S., M.D., Senior Intern in Medicine

DENTAL INTERN

[1]Donald G. Russell, D.D.S.

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[1] April 1, 1943 to June 30, 1943.

UNIVERSITY HOSPITAL DISPENSARY STAFF

Emma Winship, R.N.
Dispensary Director

DISPENSARY COMMITTEE

John E. Legge, *Chairman*
Emma Winship, R.N., *Secretary*

Louis H. Douglass
J. Mason Hundley, Jr.
C. Loring Joslin
★John E. Savage
★George H. Yeager
Ralph P. Truitt

Chief of Medical Clinic	John E. Legge
Assistant Chiefs of Medical Clinic	★Lewis P. Gundry ★Irving Freeman Kurt Levy Samuel Legum
Physicians	M. A. Fine Charles R. Goldsborough Meyer W. Jacobson ‡Samuel Gertman ★M. Paul Byerly Samuel J. Hankin ‡S. Lloyd Johnson Anthony F. Carozza †H. Edmund Levin †C. Victor Richards
Chief of Gastro-Enterology Clinic	Zachariah Morgan
Assistant Chiefs of Gastro-Enterology Clinic	★Francis G. Dickey Z. Vance Hooper
Assistant Gastro-Enterologists	‡Ernest Levi ‡M. S. Koppelman ★Samuel Morrison Albert J. Shochat ‡William Greenfeld ★Charles V. Sevcik †Alfred S. Lederman
Chief of Neurology Clinic	Leon Freedom
Assistant Neurologists	Benjamin Pushkin ‡Bernhard Badt ★William L. Fearing ★Harry A. Teitelbaum
Chief of Psychiatric Clinic	Ralph P. Truitt

Assistant Psychiatrists	★H. W. Newell ★Harry Goldsmith Alice J. Rockwell ★Joseph Marshall ★H. Robert Blank Samuel Barkoff Hans W. Loewald ★Sidney Berman †Mabel Wilkins
Chief of Chest Clinic	E. H. Tonolla
Assistants, Diseases of the Lungs	★Manuel Levin Meyer W. Jacobson John Constantini Carl P. Roetling ★Joseph E. Muse, Jr. Hugh J. Welch
Chief of Metabolism Clinic	★Lewis P. Gundry
Assistants in Metabolism Clinic	★William G. Helfrich ★Walter E. Karfgin ★A. Goldman †Louis V. Blum †W. Grafton Hersperger
Chief of Cardiovascular Clinic	★William S. Love, Jr.
Acting Chief of Cardiovascular Clinic	C. Edward Leach
Assistant Chiefs of Cardiovascular Clinic	‡Robert W. Garis ★Robert B. Mitchell, Jr.
Assistant Cardiologists	Samuel J. Hankin Anthony F. Carozza ★Irving Freeman ★Harry M. Robinson, Jr. ★Ephraim T. Lisansky ★‡F. Frederick Ruzicka †H. F. Ermshar
Chief of Allergy Clinic	H. M. Bubert
Assistant Chief of Allergy Clinic	★Edward S. Kallins
Assistant Allergists	‡★Paul E. Carliner Samuel Snyder Frank V. Manieri ★S.Edwin Muller
Allergy Clinic Technician	Betty Gershenson
Director, Pediatric Clinic	C. Loring Joslin
Chiefs of Pediatric Clinic	John H. Traband Clewell Howell

Assistant Pediatricians	★M. PAUL BYERLY A. H. FINKELSTEIN SAMUEL S. GLICK §F. STRATTNER OREM ★ISRAEL P. MERANSKI WILLIAM M. SEABOLD ★JEROME FINEMAN §H. WHITNEY WHEATON ALBERT JAFFE ‡S. LILIENFELD ★LAURISTON L. KEOWN ‡ISRAEL ROSEN ★JOSEPH R. MEYEROWITZ ★GIBSON J. WELLS ‡ROBERT J. GORE LOUIS V. BLUM ★EARL S. SCOTT ARNOLD F. LAVENSTEIN WILLIAM E. WEEKS †THOMAS A. HEDRICK
Chief of Surgical Clinic	★GEORGE H. YEAGER
Assistant Surgeons	‡J. FRANK HEWITT THURSTON R. ADAMS LUTHER E. LITTLE ★GEORGE H. BROUILLET W. R. JOHNSON ★SAMUEL E. PROCTOR ‡JAMES C. OWINGS ★CLARENCE P. SCARBOROUGH WILLIAM B. SETTLE
Chief of Orthopaedic Surgery Clinic	ALLEN FISKE VOSHELL
Assistant Orthopaedic Surgeons	JOHN V. HOPKINS MOSES GELLMAN ★HENRY F. ULLRICH FRED DUCKWALL
Chief of Genito-Urinary Clinic	W. H. TOULSON
Assistant Genito-Urinary Surgeons	W. A. H. COUNCILL JOHN F. HOGAN LYLE J. MILLAN ★HARRY S. SHELLEY ★HOWARD B. MAYS †MORRIS A. FINE
Chiefs of Roentgenology Clinic	HENRY J. WALTON ★WALTER L. KILBY
Assistant Roentgenologist	CHARLES N. DAVIDSON
Chief of Dermatology Clinic	HARRY M. ROBINSON, SR.

Assistant Dermatologists	Rollin C. Hudson ★Harry M. Robinson, Jr. Jeannette R. Heghinian ★Lester N. Kolman ★Mark Hollander ★Benjamin Highstein Solomon Tanenbaum †Frederic A. Glass
Chief of Rhinology and Laryngology Clinic	Benjamin S. Rich
Assistant Rhinologists and Laryngologists	Joseph Nurkin Cleo D. Stiles Thomas R. O'Rourk M. Baylus †Frederick T. Kyper †Samuel L. Fox
Chief of Proctology Clinic	★Monte Edwards
Assistant Proctologist	‡James C. Owings †Thurston R. Adams
Chief of Gynecology Clinic	J. Mason Hundley, Jr.
Assistant Chief of Gynecology Clinic	Beverley C. Compton
Assistant Gynecologists	Thomas S. Bowyer John C. Dumler John T. Hibbitts ★Ernest I. Cornbrooks, Jr. William B. Settle ★Kenneth B. Boyd W. Allen Deckert ★Everett S. Diggs ‡Charles B. Marek Helen I. Maginnis William K. Diehl
Female Cystoscopists	J. Mason Hundley, Jr. ‡W. Allen Deckert Beverley C. Compton ‡John C. Dumler William K. Diehl
Chief of Oral Surgery Clinic	★Brice M. Dorsey
Oral Surgeons	Harold Goldstein Samuel H. Bryant
Chief of Obstetrical Clinic	★John E. Savage
Assistant Chief of Obstetrical Clinic	Dudley P. Bowe

Assistant Obstetricians	Margaret B. Ballard Maxwell L. Mazer ★Jaroslav Hulla W. Allen Deckert ★Joseph M. Blumberg Hugh B. McNally ★Ferd E. Kadan ★Jacob R. Jensen J. Edward Norris ★J. Warren Albrittain D. McClelland Dixon ★W. Kenneth Mansfield, Jr. ★Daniel I. Dann D. Frank Kaltreider †Thomas S. Bowyer †Richard L. Goyne ★†L. Calvin Gareis
Oncology Clinic, Gynecological Division	J. Mason Hundley, Jr. Beverley C. Compton John C. Dumler William K. Diehl
Oncology Clinic, Surgical Division	Grant E. Ward E. Eugene Covington J. Duer Moores ★Murray M. Copeland ★Arthur G. Siwinski William K. Diehl
Chief of Ophthalmology Clinic	Henry F. Graff
Assistant Ophthalmologists	★Frank A. Holden Thomas R. O'Rourk Milton C. Lang Jerome Snyder
Directress, Occupational Therapy	Miss Nancy Valliant
Directress, Social Service	Miss Grace Pearson

UNIVERSITY HOSPITAL DISPENSARY REPORT

October 1, 1941 to September 30, 1942

Departments	*New Cases*	*Old Cases*	*Total*
Alergy Clinic	153	3,440	3,593
Cardiology	153	1,475	1,628
Curative Workshop	147	1,811	1,958
Cystoscopy	84	516	600
Dermatology	4,801	11,461	16,262
Diabetic	75	983	1,058
Gastro-Intestinal	221	1,109	1,330
Genito-Urinary	510	1,126	1,636
Gynecology	1,751	5,082	6,833
Hematology	19	146	165
Medicine	1,569	3,248	4,817
Neurology	214	970	1,184
Obstetrics	2,063	14,878	16,941
Oncology	263	1,643	1,906
Ophthalmology	1,276	4,003	5,279
Oral Surgery	584	590	1,174
Orthopaedics	1,454	3,413	4,867
Pediatrics	2,294	8,607	10,901
Physiotherapy	138	1,676	1,814
Plastic Surgery	34	36	70
Proctology	212	195	407
Psychiatry	147	624	771
Rhinolaryngology and Otology	1,356	1,790	3,146
Surgery	2,471	8,355	10,826
Tuberculosis	251	1,585	1,836
Total	22,240	78,762	101,002

MERCY HOSPITAL

BOARD OF GOVERNORS

★Walter D. Wise, *Chairman*

Sister M. Veronica
Sister M. Celeste
Sister M. Helen
Sister M. Philip
Sister M. Vincent
Sister M. Stanislaus

Henry F. Bongardt
H. Raymond Peters
★Maurice C. Pincoffs
Waitman F. Zinn
Thomas K. Galvin
Edward P. Smith
Elliott H. Hutchins

MERCY HOSPITAL STAFF

Surgeon-in-Chief	★Walter D. Wise
Acting Surgeon-in-Chief	Elliott H. Hutchins
Surgeons	Charles F. Blake F. L. Jennings R. W. Locher Thomas R. Chambers Elliott H. Hutchins ★D. J. Pessagno William F. Rienhoff ★N. Clyde Marvel Henry F. Bongardt
Associate Surgeons	I. O. Ridgely James W. Nelson Howard B. McElwain ★Simon H. Brager John A. O'Connor Thomas B. Aycock Charles W. Maxson ★I. Ridgeway Trimble ★Richard T. Shackelford Raymond F. Helfrich
Assistant Surgeons	★Julius Goodman E. Eugene Covington ★S. Demarco, Jr. T. J. Touhey William N. McFaul, Jr. ★Meyer H. Zuravin ★Howard L. Zupnik ★Daniel R. Robinson ★Joseph V. Jerardi †Wm. C. Dunnigan †Harold H. Burns
Consulting Ophthalmologist and Otologist	Harry Friedenwald

Ophthalmologists and Otologists	H. K. Fleck §J. W. Downey M. Raskin
Associate Ophthalmologists and Otologists	Joseph I. Kemler F. A. Pacienza
Assistant Ophthalmologist and Otologist	★Joseph V. Jeppi
Consulting Rhinologists and Laryngologists	W. Raymond McKenzie George W. Mitchell
Rhinologist and Laryngologist	Waitman F. Zinn
Associate Rhinologists and Laryngologists	F. A. Kayser Benjamin S. Rich ★Theodore A. Schwartz ★Birkhead Macgowan
Assistant Rhinologist and Laryngologist	★Joseph V. Jeppi
Bronchoscopist	Waitman F. Zinn
Associate Bronchoscopist	F. A. Kayser
Assistant Bronchoscopist	★Theodore A. Schwartz
Proctologist	Charles F. Blake
Assistant Proctologist	E. Eugene Covington
Orthopaedic Surgeon	Albertus Cotton
Associate Orthopaedic Surgeon	H. L. Rogers
Assistant Orthopaedic Surgeons	I. H. Maseritz J. H. Gaskel
Urologist	Kenneth D. Legge
Associate Urologists	Leon K. Fargo Francis W. Gillis
Dermatologists	†Francis A. Ellis †William D. Wolfe
Dentist	★J. D. Fusco
Assistant Dentists	J. J. Foley ★B. Wallace Inman †Stuart Buppert
Consulting Physician	★Maurice C. Pincoffs
Physician-in-Chief	H. Raymond Peters
Physicians	[1]§C. B. Gamble Harvey G. Beck Thomas P. Sprunt George McLean J. Sheldon Eastland ★Louis A. M. Krause
Associate Physicians	Hubert C. Knapp Bartus T. Baggott Thomas C. Wolff Wetherbee Fort John E. Legge T. Nelson Carey Sol Smith

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[1] §Died June 1, 1943.

Assistant Physicians	S. A. Tumminello J. Howard Burns Earl L. Chambers K. W. Golley ‡J. M. Miller ‡Wm. H. Grenzer ★†William H. Kammer, Jr. ★†Donald J. Roop ★†S. Edwin Muller
Associate Gastro-Enterologists	T. Frederick Leitz Theodore H. Morrison
Assistant Gastro-Enterologists	Maurice Feldman Joseph Sindler
Pediatricians	Edgar B. Friedenwald Frederick B. Smith
Associate Pediatricians	§★Thomas J. Coonan G. Bowers Mansdorfer
Assistant Pediatricians	William J. Schmitz William M. Seabold ★Jerome Fineman
Neurologist and Psychiatrist	Andrew C. Gillis
Associate Neurologists and Psychiatrists	★Harry Goldsmith Philip F. Lerner
Obstetrician-in-Chief	Edward P. Smith
Obstetricians	§Abram S. Samuels Ernest S. Edlow William S. Gardner Thomas K. Galvin ★†Frank K. Morris John J. Erwin
Associate Obstetrician	†Charles H. Doeller, Jr.
Assistant Obstetrician	★‡William B. Smith †J. Howard Burns
Consulting Gynecologist	William S. Gardner
Gynecologists	§Abram S. Samuels Thomas K. Galvin Edward P. Smith George S. Strauss, Jr.
Associate Gynecologists	J. J. Erwin Ernest S. Edlow ★Frank K. Morris
Assistant Gynecologist	★Harry L. Granoff †Charles H. Doeller, Jr.

Pathologists	★Walter C. Merkel Hugh R. Spencer †C. Gardner Warner
Clinical Pathologists	H. T. Collenberg H. Raymond Peters Charles E. Bramble
Technicians	Eleanor Behr Sister Paula Marie Willa Murphy Jane House
Radiographer	Albertus Cotton
Associate Radiographer	Harry L. Rogers
Assistant Radiographer	★A. D. Young †William Greenfeld
Technicians	Sister M. Kevin Charlotte Clopter Henrietta McCaffery

ANNUAL HOSPITAL APPOINTMENTS

The following annual appointments are made to the Mercy Hospital:

Five Residents in Surgery
Three Residents in Medicine
Resident in Rhinology
Two Residents in Gynecology
Twelve Interns on Rotating Service

MERCY HOSPITAL RESIDENT AND INTERN STAFF

JULY 1, 1942 TO APRIL 15, 1943

RESIDENT STAFF

★Howard F. Kinnamon, Jr., M.D., *Resident Surgeon.*
F. Ford Loker, B.S., M.D., *Associate Resident Surgeon.*
John L. Gillespie, B.S., M.D., *First Assistant Resident Surgeon.*
★Michael L. DeVicentis, B.S., M.D., *Assistant Resident Surgeon.*
Tracy N. Spencer, Jr., A.B., M.D., *Assistant Resident Surgeon.*
Theodore Joseph Graziano, A.B., M.D., *Assistant Resident Surgeon.*
★Donald J. Roop, A.B., M.D., *Resident Physician.*
William C. Lowe, B.S., M.D., *Assistant Resident Physician.*
★Edward L. Frey, Jr., A.B., M.D., *Assistant Resident Physician.*
Thomas A. Hedrick, M.D., *Assistant Resident Physician.*
★Harry McBrine Beck, A.B., M.D., *Resident Gynecologist.*
William C. Duffy, A.B., M.D., *Resident Obstetrician.*
Joseph C. Sheehan, B.S., M.D., *Assistant Resident in Gynecology and Obstetrics.*
Robert B. Sasscer, A.B., M.D., *Assistant Resident in Gynecology and Obstetrics.*

INTERNS

William Alstrom Ahroon, A.B., M.D.
★Harry Franklin Coffman, A.B., M.D.
★Matthew Mordica Cox, M.D.
★Thomas Eugene Davies, M.D.
John Russell Davis, Jr., A.B., M.D.
★Robert Allan Kiefer, A.B., M.D.
★John Carlton Osborne, B.S., M.D.
Patrick Carey Phelan, A.B., M.D.
Edward Peyton Ritchings, A.B., M.D.
★James George Stegmaier, B.S., M.D.

ANNOUNCEMENT OF

MERCY HOSPITAL RESIDENT AND INTERN STAFF

APRIL 15, 1943 TO JANUARY 1, 1944

RESIDENT STAFF

F. Ford Loker, B.S., M.D., *Resident Surgeon.*
John L. Gillespie, B.S., M.D., *Associate Resident Surgeon.*
Patrick C. Phelan, Jr., A.B., M.D., *First Assistant Resident Surgeon.*
★Thomas E. Davies, M.D., *Assistant Resident Surgeon.*
★James G. Stegmaier, B.S., M.D., *Assistant Resident Surgeon.*
William C. Duffy, A.B., M.D., *Resident Gynecologist.*
Joseph C. Sheehan, B.S., M.D., *Resident Obstetrician.*
William C. Lowe, B.S., M.D., *Resident Physician.*
★John C. Osborne, B.S., M.D., *Assistant Resident Physician.*
John R. Davis, Jr., A.B., M.D., *Assistant Resident Physician.*
★Robert A. Kiefer, A.B., M.D., *Assistant Resident Physician.*

INTERNS

Maurice L. Aderholt, A.B., M.D.
Robert Z. Berry, A.B., B.S., M.D.
Thomas Brennan, B.S., M.D.
Ross C. Brooks, B.S., M.D.
Toney R. Giglia, B.S., M.D.
David B. Gray, B.S., M.D.
Ferdinand W. Lee, B.S., M.D.
Joseph C. Myers, A.B., M.D.
J. Emmett Queen, A.B., M.D.
Robert B. Tunney, B.S., M.D.
J. Carlton Wich, M.D.
Henry F. Zangara, B.S., M.D.

MERCY HOSPITAL DISPENSARY STAFF

Supervisor of Surgical Clinic	Raymond F. Helfrich
Assistant Supervisor of Surgical Clinic	Harold H. Burns
Assistant Surgeons	I. O. Ridgely H. F. Bongardt James W. Nelson ★I. Ridgeway Trimble ★Simon H. Brager ★S. Demarco, Jr. E. Eugene Covington ★Richard T. Shackelford ★Meyer H. Zuravin ★Howard L. Zupnik ★Daniel R. Robinson ★Joseph V. Jerardi ★Raymond J. Lipin ★William M. Garlick
Supervisor of Genito-Urinary Clinic	Kenneth D. Legge
Assistant Genito-Urinary Surgeons	L. K. Fargo Francis W. Gillis
Orthopaedic Surgeons	Albertus Cotton Harry L. Rogers I. H. Maseritz Jason H. Gaskel
Supervisors of Medical Clinic	H. Raymond Peters ★Maurice C. Pincoffs
Chiefs of Medical Clinic	Sol Smith William H. Grenzer
Assistant Physicians	★Milton Stein ‡Thomas G. Abbott Louis F. Klimes ★Irving Freeman Nathaniel M. Beck ★†S. Edwin Muller
Chief of Cardiovascular Clinic	Thomas C. Wolff
Assistant Cardiologist	Leon Ashman
Chief of Metabolism Clinic	J. Sheldon Eastland
Assistant	Louis F. Klimes

Gastro-Enterologist	Maurice Feldman
Chief of Pediatric Clinic	Edgar B. Friedenwald
Pediatricians	G. Bowers Mansdorfer ★Jerome Fineman George Bayley
Supervisor of Neurological and Psychiatric Clinic	Andrew C. Gillis
Neurologists and Psychiatrists	★Harry Goldsmith Philip F. Lerner John W. Machen George C. Medairy
Supervisor of Dermatology Clinic	Francis A. Ellis
Dermatologist	William D. Wolfe
Oncologist	James W. Nelson
Chief of Gynecology Clinic	Thomas K. Galvin
Gynecologists	Edward P. Smith Ernest S. Edlow ★H. L. Granoff John J. Erwin ★Frank K. Morris George A. Strauss, Jr. †Charles H. Doeller, Jr.
Chief of Obstetrical Clinic	Edward P. Smith
Obstetricians	★William A. Dodd ★Harry McBrine Beck †Charles H. Doeller, Jr. †J. Howard Burns †William C. Duffy
Esophagoscopist	Waitman F. Zinn
Rhinologists and Laryngologists	Waitman F. Zinn Benjamin S. Rich ★Theodore A. Schwartz †Samuel L. Fox †Albert A. Maybeno
Ophthalmologists and Otologists	M. Raskin F. A. Pacienza ★Joseph V. Jeppi F. Edwin Knowles, Jr.
Supervisor of Proctology Clinic	Charles F. Blake
Proctologists	E. Eugene Covington ★Simon H. Brager
Supervisor of Dental Clinic	†Conrad L. Inman
Dentists	★J. D. Fusco ★B. Wallace Inman †Stuart Buppert

Supervisor of Physiotherapy Clinic	Leon Hannan
Assistant Physiotherapist	Alice R. Hannan
Social Worker	Margaret Travers
Secretaries	Eleanor Arnick Eva Applegarth

MERCY HOSPITAL DISPENSARY REPORT

Year of 1942

Department	*New Cases*	*Old Cases*	*Total*
Bronchoscopic	842	206	1,048
Cardiology	378	18	396
Dental	101	51	152
Dermatology	331	161	492
Diabetic	301	2	303
Gastro-Intestinal	241	33	274
Genito-Urinary	1,065	129	1,194
Gynecology	721	220	941
Medicine	1,964	474	2,438
Neurology	455	53	508
Ophthalmology	524	179	703
Pediatrics	642	206	848
Physiotherapy	1,243	89	1,332
Postnatal	265	241	506
Prenatal	2,705	402	3,107
Proctology	42	12	54
Rhinolaryngology	911	413	1,324
Surgery	2,587	793	3,380
Surgical Follow-Up	336	97	433
Tumor	5		5
Well Baby Clinic	43	43	86
Totals	16,440	4,005	20,445

THE BALTIMORE CITY HOSPITALS

STAFF, 1943–1944

Parker J. McMillin, *Superintendent*

Consulting Chief Surgeon	Arthur M. Shipley, M.D., D.Sc.
Surgeon-in-Chief	Thomas B. Aycock, B.S., M.D.
Physician-in-Chief	★John T. King, Jr., A.B., M.D.
Physician-in-Chief	†C. Holmes Boyd, M.D.
Physician-in-Chief, X-ray	Howard H. Ashbury, M.D.
Physician-in-Chief, Tuberculosis Hospital	Lawrence M. Serra, M.D.
Physician-in-Chief, Psychopathic Hospital	Esther L. Richards, M.D.
Obstetrician-in-Chief	Louis H. Douglass, M.D.
Pediatrician-in-Chief	★T. Campbell Goodwin, A.B., M.D.
Pediatrician-in-Chief	Edward M. Bridge, M.D.
Pathologist-in-Chief	Frank B. Kindell, A.B., M.D.
Dental Surgeon-in-Chief	Lowell P. Henneberger, D.D.S.
Assistant Surgeon-in-Chief	Otto C. Brantigan, M.D
Visiting Surgeons	‡James C. Owings, M.D. ★Harry C. Hull, M.D. Samuel McLanahan, Jr., A.B., M.D. Thurston R. Adams
Consultant in Traumatic Surgery	Charles A. Reifschneider, M.D.
Consultants in General Surgery	F. C. Lee, M.D. ★I. Ridgeway Trimble, M.D.
Consultant in Peripheral Vascular Diseases	★George H. Yeager, B.S., M.D.
Consultants in Plastic Surgery	Edward A. Kitlowski, M.D. Edward M. Hanrahan, Jr., M.D.
Assistant Visiting Surgeons	Luther E. Little, M.D. Edgar J. Poth, M.D. Philip B. Price, M.D. Harris B. Shumacker, M.D.
Assistant Visiting Physician, Tuberculosis	William H. Grenzer, M.D.
Assistant Visiting Psychiatrist	Thomas A. C. Rennie, M.D.
Visiting Obstetrician	J. Morris Reese, M.D.
Assistant Visiting Obstetricians	John M. Haws, B.S., M.D. Marius P. Johnson, A.B., M.D. ★John E. Savage, B.S., M.D. Hugh B. McNally, B.S., M.D. ★William Dorman, M.D.
Visiting Pediatricians	★William B. Stifler, M.D. ★B. Matthew DeBuskey, M.D.
Assistant Visiting Pediatrician	William M. Seabold, A.B., M.D.
Visiting Gynecologist	J. Mason Hundley, Jr., M.A., M.D.
Assistant Visiting Gynecologists	Beverley Compton, M.D. John C. Dumler, B.S., M.D. John T. Hibbitts, M.D. ★Ernest I. Cornbrooks, Jr., M.D. William B. Settle, M.D. William K. Diehl, M.D.

Assistant Chief Physician	†Howard K. Rathbun, M.D.
Visiting Physicians	★John W. Parsons, M.D. ★Louis A. M. Krause, M.D. †Harry F. Klinefelter, Jr., M.D.
Assistant Visiting Physician	†Thurston Harrison, M.D.
Visiting Cardiologist	★Raymond Hussey, M.A., M.D.
Visiting Ophthalmologist	Frank B. Walsh, M.D.
Visiting Orthopaedic Surgeon	Allen F. Voshell, A.B., M.D.
Assistant Visiting Orthopaedic Surgeon	★Henry F. Ullrich, M.D., D.Sc.
Visiting Laryngologists	Thomas R. O'Rourk, M.D. ★John Bordley, M.D.
Assistant Visiting Laryngologist	Donald F. Proctor, M.D.
Visiting Urologist	W. Houston Toulson, M.Sc., M.D.
Assistant Visiting Urologists	★Hugh Jewett, M.D. ★Howard B. Mays, M.D.
Visiting Neurological Surgeon	Charles Bagley, Jr., M.A., M.D.
Assistant Visiting Neurological Surgeon	Richard G. Coblentz, M.A., M.D.
Visiting Neurologists	Frank R. Ford, M.D. O. R. Langworthy, M.D.
Assistant Visiting Neurologists	★Harry A. Teitelbaum, M.D. Luis Ortega, M.D.
Visiting Proctologist	★Monte Edwards, M.D.
Visiting Oncologists	Grant E. Ward, A.B., M.D. ★Murray M. Copeland, M.D.
Assistant Visiting Otologist	J. J. Belemer, M.D.
Visiting Dermatologist	Isaac R. Pels, M.D.
Visiting Dental Surgeon	H. Glenn Waring, D.D.S.
Assistant Visiting Dental Surgeons	L. W. Bimestefer, D.D.S. ★Joseph B. Berke, D.D.S. ★B. W. Miksinski, D.D.S.

THE JAMES LAWRENCE KERNAN HOSPITAL AND INDUSTRIAL SCHOOL OF MARYLAND FOR CRIPPLED CHILDREN

STAFF, 1943–1944

Surgeon-in-Chief and Medical Director	Allen Fiske Voshell, A.B., M.D.
Attending Orthopaedic Surgeon and Roentgenologist	Albertus Cotton, A.M., M.D.
Associate Orthopaedic Surgeons	Moses Gellman, B.S., M.D. Harry Rogers, M.D. Winthrop M. Phelps, A.B., M.D.
Plastic Surgeon	Edward A. Kitlowski, A.B., M.D.
Aurist and Laryngologist	Benjamin S. Rich, A.B., M.D.
Dentist	M. E. Coberth, D.D.S.
Pediatrist	†Helen M. Taussig, M.D.
Consulting Surgeons	Arthur M. Shipley, M.D., Sc.D. Charles Reid Edwards, A.B., M.D. Thomas B. Aycock, B.S., M.D.
Consulting Aurist and Laryngologist	Franklin B. Anderson, M.D. Edward A. Looper, M.D., D.Oph.
Consulting Neurological Surgeon	Charles Bagley, Jr., M.A., M.D.
Consulting Plastic Surgeon	John Staige Davis, B.Sc., M.D.
Consulting Physicians	Thomas R. Brown, A.B., M.D. §Lewellys F. Barker, A.B., M.D.
Consulting Dermatologists	Harry M. Robinson, Sr., M.D. Leon Ginsberg, M.D.
Consulting Neurologists	Irving J. Spear, M.D. R. V. Seliger, M.D.
Consulting Pediatrist	Benjamin Tappan, A.B., M.D.
Consulting Dentist	Harry B. McCarthy, D.D.S.
Consulting Opthalmologists	Harry Friedenwald, A.B., M.D., D.H.L., D.Sc. William Tarun, M.D.
Consulting Pathologist	Hugh R. Spencer, M.D.
Consulting Roentgenologist	Henry J. Walton, M.D.
Resident Orthopaedic Surgeons	†Charles J. Basile, M.D. †Wm. L. Waldrop, M.D.
Superintendent	Miss Maud M. Gardner, R.N.
Dispensary and Social Service Nurse	Mrs. Evelyn Byrd Zapf, R.N.
Physical Therapists and X-ray Technician	★Miss Jane Ewing, P.T., Reg. Mrs. Georgiana Wisong
Occupational Therapist	Miss Muriel Zimmerman, O.T.
Instructor in Grammar School	Mrs. Laura Siemon

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§ Died July 13, 1943.

HISTORY OF THE SCHOOL OF MEDICINE

The present School of Medicine, with the title University of Maryland School of Medicine and College of Physicians and Surgeons, is the result of a consolidation and merger of the University of Maryland School of Medicine with the Baltimore Medical College (1913) and the College of Physicians and Surgeons of Baltimore (1915).

Through the merger with the Baltimore Medical College, an institution of thirty-two years' growth, the facilities of the School of Medicine were enlarged in faculty, equipment and hospital connection.

The College of Physicians and Surgeons was incorporated in 1872, and established on Hanover Street in a building afterward known as the *Maternité*, the first obstetrical hospital in Maryland. In 1878 union was effected with the Washington University School of Medicine, in existence since 1827, and the college was removed to Calvert and Saratoga Streets. Through the consolidation with the College of Physicians and Surgeons, medical control of the teaching beds in the Mercy Hospital was obtained.

The School of Medicine of the University of Maryland is one of the oldest foundations for medical education in America, ranking fifth in point of age among the medical colleges of the United States. It was organized in 1807, and chartered in 1808, under the name of the College of Medicine of Maryland, and its first class was graduated in 1810. In 1812 the College was empowered by the Legislature to annex three other colleges or faculties: Divinity, Law, and Arts and Sciences; and the four colleges thus united were "constituted an University by the name and under the title of the University of Maryland."

The original building of the Medical School at the N. E. corner of Lombard and Greene Streets, was erected in 1812. It is the oldest structure in this country from which the degree of doctor of medicine has been granted annually since its erection. In this building were founded one of the first medical libraries and one of the first medical school libraries in the United States.

At this Medical School dissection was made a compulsory part of the curriculum, and independent chairs for the teaching of gynecology and pediatrics (1867), and of ophthalmology and otology (1873), were installed for the first time in America.

This School of Medicine was one of the first to provide for adequate clinical instruction by the erection of its own hospital in 1823. In this hospital intramural residency for senior students was established for the first time.

BUILDINGS AND FACILITIES

The original medical building at the N. E. corner of Lombard and Greene Streets houses the office of the Dean, Office of the Assistant Dean, the Conference Room of the Faculty and two lecture halls.

The Administration Building, to the east of the original building, contains the Baltimore offices of the Registrar and the Director of Admissions and two lecture halls.

The laboratory building at 31 South Greene Street is occupied by the departments of Pathology, Bacteriology and Biochemistry.

The Frank C. Bressler Research Laboratory provides the departments of Anatomy, Histology and Embryology, Pharmacology, Physiology and Clinical Pathology with facilities for teaching and research. It also houses the research laboratories of the clinical departments, animal quarters, a laboratory for teaching Operative Surgery, a lecture hall and the Bressler Memorial Room.

This building was erected in 1939–1940 at 29 South Greene Street opposite the University Hospital. It was built with funds left to the School of Medicine by the late Frank C. Bressler, an alumnus, supplemented by a grant from the Federal government. The structure, in the shape of an I, extends east from Greene Street, just north of the original building.

MEDICAL LIBRARY

This library comes under the general supervision of Mr. Carl W. E. Hintz, A.B., A.M.L.S., the University librarian. There are five assistants who work in the Medical Library.

The Medical Library of the University of Maryland, founded in 1813 by the purchase of the collection of Dr. John Crawford, now numbers 22,500 volumes and several thousand pamphlets and reprints. Over three hundred of the leading medical journals, both foreign and domestic, are received regularly. The library is housed in Davidge Hall, a comfortable and commodious building in close proximity to classrooms and laboratories, and is open daily for the use of members of the faculty, the student body and the profession generally. Libraries pertaining to particular phases of medicine are maintained by several departments of the medical school.

The library of the Medical and Chirurgical Faculty of Maryland and the Welch Medical Library are open to students of the medical school without charge. Other libraries of Baltimore are the Peabody Library and the Enoch Pratt Free Library.

DISPENSARY BUILDING

The old hospital building has been remodeled and is occupied by the Out-patient Department. Thus the students have been provided with a splendidly appointed group of clinics for their training in out-patient work. All departments of clinical training are represented in this remodeled building and all changes have been predicated on the teaching function for which this department is intended.

The office of the Medical School Physician is located in this building.

The Department of Art also occupies quarters here.

UNIVERSITY HOSPITAL

The University Hospital, which is the property of the University of Maryland, is the oldest institution for the care of the sick in the state of Maryland. It was opened in September 1823, under the name of the Baltimore Infirmary, and at that time consisted of but four wards, one of which was reserved for patients with diseases of the eye.

In 1933–1934 the new University Hospital was erected, and patients were admitted to this building in November 1934. The new hospital is situated at the southwest corner of Redwood and Greene Streets, and is consequently opposite the medical school buildings. The students, therefore, are in close proximity and little time is lost in passing from the lecture halls and laboratories to the clinical facilities of the new building.

This new building, with its modern planning, makes a particularly attractive teaching hospital and is a very valuable addition to the clinical facilities of the medical school.

The new hospital has a capacity of 435 beds and 65 bassinets devoted to general medicine, surgery, obstetrics, pediatrics, and the various medical and surgical specialties.

The teaching zone extends from the second to the eighth floor and comprises wards for surgery, medicine, obstetrics, pediatrics, and a large clinical lecture hall. There are approximately 270 beds available for teaching.

The space of the whole north wing of the second floor is occupied by the Department of Roentgenology. The east wing houses clinical pathology and special laboratories for clinical microscopy, biochemistry, bacteriology, and an especially well appointed laboratory for students' training. The south wing provides space for electro-cardiographic and basal metabolism departments, with new and very attractive air-conditioned or oxygen therapy cubicles. The west wing contains the Departments of Rhinolaryngology and Bronchoscopy, Industrial Surgery, Ophthalmology, and Male and Female Cystoscopy.

The third and fourth floors each provide two medical and two surgical wards. The fifth floor contains two wards for pediatrics, and on the sixth floor there are two wards for obstetrics. Each ward occupies the space of one wing of the hospital.

On the seventh floor is the general operating suite, the delivery suite, and the central supply station. The eighth floor is essentially a students' floor and affords a mezzanine over the operating and delivery suites, and a students' entrance to the clinical lecture hall.

In the basement there is a very well appointed Pathological Department with a large teaching autopsy room and its adjunct service of instruction of students in pathological anatomy.

The hospital receives a large number of accident patients because of its proximity to the largest manufacturing and shipping districts of the city.

The obstetrical service is particularly well arranged and provides accommodation for forty ward patients. This service, combined with an extensive home service, assures the student abundant obstetrical training.

During the year ending December 31, 1942, 1789 cases were delivered in the hospital and 1317 cases in the outdoor department. Students in the graduating class observed at least thirty-five cases, each student being required to deliver at least ten patients in their homes.

The dispensaries associated with the University Hospital and the Mercy Hospital are organized upon a uniform plan in order that the teaching may be the same in each. Each dispensary has the following departments: Medicine, Surgery, Pediatrics, Ophthalmology, Otology, Genito-Urinary, Gynecology, Gastro-Enterology, Neurology, Orthopaedics, Proctology, Dermatology, Laryngology, Rhinology, Cardiology, Tuberculosis, Psychiatry, Oral Surgery and Oncology.

All students in their junior year work each day during one-third of the year in the Departments of Medicine and Surgery of the dispensaries. In their senior year, all students work one hour each day in the special departments.

MERCY HOSPITAL

The Sisters of Mercy first assumed charge of the Hospital at the corner of Calvert and Saratoga Streets, then owned by the Washington University, in 1874. By the merger of 1878 the Hospital came under the control of the College of Physicians and Surgeons, but the Sisters continued their work of ministering to the patients.

In a very few years it became apparent that the City Hospital, as it was then called, was much too small to accommodate the rapidly growing demands upon it. However, it was not until 1888 that the Sisters of Mercy, with the assistance of the Faculty of the College of Physicians and Surgeons, were able to lay the cornerstone of the present hospital. This building was completed and occupied late in 1889. Since then the growing demands for more space have compelled the erection of additions, until now there are accommodations for 348 patients.

In 1909 the name was changed from The Baltimore City Hospital to Mercy Hospital.

The clinical material in the free wards is under the exclusive control of the Faculty of the University of Maryland School of Medicine and College of Physicians and Surgeons.

THE BALTIMORE CITY HOSPITALS

The clinical facilities of the School of Medicine have been largely increased by the liberal decision of the Department of Public Welfare to allow the use of the wards of these hospitals for medical education. The autopsy material also is available for student instruction.

Members of the junior class make daily visits to these hospitals for clinical instruction in medicine, surgery, and the specialties.

The Baltimore City Hospitals consist of the following separate divisions:

The General Hospital, 400 beds, 90 bassinets.
The Hospital for Chronic Cases, 575 beds.
The Hospital for Tuberculosis, 280 beds.
The Psychopathic Hospital, 85 beds.
Infirmary (Home for Aged) 1053 beds.

THE JAMES LAWRENCE KERNAN HOSPITAL AND INDUSTRIAL SCHOOL OF MARYLAND FOR CRIPPLED CHILDREN

This institution is situated on an estate of 75 acres at Dickeyville. The site is within the northwestern city limits and of easy access to the city proper.

The location is ideal for the treatment of children, in that it affords all the advantages of sunshine and country air.

A hospital unit, complete in every respect, offers all modern facilities for the care of any orthopaedic condition in children.

The hospital is equipped with 100 beds—endowed, and city and state supported.

The Orthopaedic Dispensary at the University Hospital is maintained in closest affiliation and cares for the cases discharged from the Kernan Hospital. The Physical Therapy Department is very well equipped with modern apparatus and trained personnel. Occupational therapy has been fully established and developed under trained technicians.

THE BALTIMORE EYE, EAR, AND THROAT HOSPITAL

This institution was first organized and operated in 1882 as an outgrowth of the Baltimore Eye and Ear Dispensary, which closed on June 14, 1882. The name then given to the new hospital was The Baltimore Eye and Ear Charity Hospital. It was located at the address now known as 625 W. Franklin St. The out-patient department was opened on September 18, 1882 and the hospital proper on November 1 of the same year. In 1898 a new building afforded 24 free beds and 8 private rooms; by 1907 the beds numbered 47; at present there are 60 beds, 29 of which are free. In 1922 the present hospital building at 1214 Eutaw Place was secured and in 1926 the dispensary was opened. In 1928 a clinical laboratory was installed. During 1942 the out-patient visits numbered 20,394.

Through the kindness of the Hospital Board and Staff, our junior students have access to the dispensary which they visit in small groups for instruction in ophthalmology.

WARTIME REQUIREMENTS FOR ADMISSION

This school is cooperating with the Army Specialized Training Program and the Navy College Training Program.

ANNOUNCEMENT OF TWO-YEAR ADMISSION REQUIREMENTS, AND DATA ON ACCELERATED PROGRAM

The School of Medicine of the University of Maryland announces the adoption of a minimum entrance requirement, in cooperation with the war effort, effective January 7, 1943, until further notice. These minimum requirements have superseded the standard requirements for the period of the emergency.

MINIMUM REQUIREMENTS FOR ADMISSION

The minimum admission requirements are two academic years (60 semester hours or 90 quarter hours) of credits, exclusive of physical education and military science, acquired at or acceptable to an approved college of arts and sciences. Included in these requirements are minimum credits in basic subjects which must be completed by every applicant before admission:

	Semester hours	*Quarter hours*
General biology or zoology	8	12
Inorganic chemistry	8	12
Organic chemistry	6	9
Physics	6 or 8*	9 or 12*
English	6	9
Modern language (Spanish, French, German, etc.)	6	9
	—	—
	40	60

(Minimum credit requirements are subject to adjustment to Army and Navy programs.)

In addition to these required subjects, electives should be chosen from courses in mathematics, English, psychology, history, sociology, political science, economics, philosophy. Supplemental courses may be taken in the basic sciences, for example, quantitative analysis in a 60 semester-hour program, and quantitative analysis and comparative vertebrate anatomy on a 90 semester-hour and degree basis.

APPLICATION FOR ADMISSION

Application forms may be filed after one semester or two quarters have been completed. Decisions on applicants for admission may be made after completion of two semesters or three quarters of college work.

Application forms and catalogues may be secured from the Committee on Admissions, School of Medicine, University of Maryland, Baltimore-1, Maryland.

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* Whichever is a basic course in the college involved.

ENTERING DATES DURING ACCELERATION

During the period of acceleration classes will be admitted about every nine months. The class entering January, 1944 has been filled.

	1943	*1944*	*1945*	*1946*
Registration begins		Oct. 17	July 10	
Classes begin		Oct. 19	July 12	
Graduation (tentative*)	Dec. 23	Sept. 29	June 22	March 25*

LENGTH OF MEDICAL COURSE, DURING ACCELERATION

The medical course consisting of four (4) full academic sessions of 32 weeks each will be completed in three (3) calendar years. Course content and length may be modified to meet wartime requirements.

GRADUATION, DURING ACCELERATION

Graduation will take place about three years after the entering date.

TRANSFER STUDENTS FROM THE TWO-YEAR MEDICAL SCHOOLS

Applicants from the two-year medical schools will be considered at the end of their first year of medical study.

STANDARD REQUIREMENTS FOR ADMISSION

METHOD OF MAKING APPLICATION

Application forms may be filed one calendar year before the next incoming class. These forms may be secured from the Committee on Admissions, School of Medicine, University of Maryland, Baltimore.

APPLICATION FOR ADMISSION TO THE FIRST YEAR

Application for admission is made by filing the required form and by having all pertinent data sent directly to the Committee on Admissions, in accordance with the instructions accompanying the application.

APPLICATION FOR ADMISSION TO ADVANCED STANDING

Students who have attended approved medical schools are eligible to file applications for admission to the second- and third-year classes. These applicants must be prepared to meet the current first-year entrance requirements in addition to presenting acceptable medical school credentials, and a medical school record based on courses which are quantitatively and qualitatively equivalent to similar courses in this school.

Application to advanced standing is made in accordance with the instructions accompanying the application form.

MINIMUM REQUIREMENTS FOR ADMISSION

The minimum requirements for admission to the School of Medicine are:

(a) Graduation from an approved secondary school, or the equivalent in entrance examinations, and

(b) Three academic years of acceptable premedical credit earned in an approved college of arts and sciences. The quantity and quality of this preprofessional course of study shall be not less than that required for recommendation by the institution where the premedical courses are being, or have been, studied.

The premedical curriculum shall include basic courses in

English
Biology
Inorganic Chemistry
Organic Chemistry
Physics
French or German

and such elective courses as will complete a balanced three-year schedule of study. The elective courses should be selected from the following three groups:

Humanities

- English (an advanced course in English composition should be taken, if possible)
- Scientific German or French (A reading knowledge of either language is desirable, although German is preferred)
- Philosophy

Natural Sciences

- Comparative Vertebrate Anatomy
- Embryology
- Quantitative Analysis
- Physical Chemistry
- Mathematics

Social Sciences

- Economics
- History
- Political Science
- Psychology (a basic course is desirable)
- Sociology, etc.

Careful attention should be given to the selection of elective courses in the natural sciences. Accordingly, it is suggested that the elective list given above be a guide in this connection and that the remainder of the college credits be accumulated from courses designed to promote a broad cultural development. Students should avoid the inclusion of college courses in subjects that occur in the medical curriculum, for example, histology, histological technique, human anatomy, bacteriology, physiology, neurology, physiological chemistry.

It is not intended that these suggestions be interpreted to restrict the education of students who exhibit an aptitude for the natural sciences or to limit the development of students who plan to follow research work in the field of medicine.

In accepting candidates for admission, preference will be given to those applicants who have acceptable scholastic records in secondary school and college, satisfactory scores in the Medical Aptitude Test, favorable letters of recommendation from their premedical committees, or from one instructor in each of the departments of biology, chemistry, and physics, and who in all other respects give every promise of becoming successful students and physicians of high standing.

Those candidates for admission who are accepted will receive certificates of entrance from the Director of Admissions of the University.

This concludes the description of the standard requirements.

COMBINED COURSE IN ARTS AND SCIENCES, AND MEDICINE

A combined seven years' curriculum leading to the degrees of Bachelor of Science and Doctor of Medicine is offered by the University of Maryland. The first three years are taken in residence in the College of Arts and Sciences at College Park, and the last four years in the School of Medicine in Baltimore. (See University catalogue for details of quantitative and qualitative premedical course requirements.)

Upon the successful completion of the first year in the School of Medicine, and upon the recommendation of the Dean, the degree of Bachelor of Science may be conferred by the College of Arts and Sciences at the commencement following the *second year* of residence.

STATE MEDICAL STUDENT QUALIFYING CERTIFICATES

Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York, should apply to their respective state boards of education for medical student qualifying certificates (Pennsylvania and New Jersey) or approval of applications for medical student qualifying certificates (New York).

Those students who are accepted must file satisfactory State certificates in the office of the Committee on Admissions, School of Medicine, before registration. No exceptions will be made to this requirement.

Addresses of the State Certifying Offices

Director of Credentials Section, Pennsylvania Department of Public Instruction, Harrisburg, Pa.

Chief of the Bureau of Credentials, New Jersey Department of Public Instruction, Trenton, N. J.

Supervisor of Qualifying Certificates, The State Education Department, Examinations and Inspections Division, Albany, N. Y.

DEFINITION OF RESIDENCE STATUS OF STUDENTS*

Students who are minors are considered to be resident students if, at the time of their registration, the parents* have been residents of this State for at least one year.

Adult students are considered to be resident students if, at the time of their registration, they have been residents of this State for at least one year, provided such residence has not been acquired while attending any school or college in Maryland.

The status of the residence of a student is determined at the time of his first registration in the university and may not thereafter be changed by him unless, in the case of a minor, his parents* move to and become legal residents of this state by maintaining such residence for at least one full calendar year. However, the right of the student (minor) to change from a non-resident to a resident status must be established by him prior to registration for a semester in any academic year.

* The term "parents" includes persons who, by reason of death or other unusual circumstances, have been legally constituted the guardians of or stand in loco parentis to such minor students.

FEES

Matriculation fee (paid once)	$10.00*
Tuition fee (each year)—Residents of Maryland	450.00
Tuition fee (each year)—Non-Residents	600.00
Laboratory fee (each year)	25.00
Conditioned examination fee (each subject)	5.00*
Student health service fee (each year)	10.00
Student activities fee (each year)	5.00*
Maintenance and service fee (each year)...Junior Class, $7.00; others,	5.00
Graduation fee	15.00*
Transcript fee to graduates. First copy gratis, each copy thereafter	1.00*

RULES FOR PAYMENT OF FEES

No fees are returnable.

The above fees apply to all students who matriculate in the School of Medicine in any class for the sessions beginning June 25, 1942 and April 8, 1943.

Make all checks or money orders payable to the University of Maryland.

When offering checks or money orders in payment of tuition and other fees, students are requested to have them drawn in the exact amount of such fees. Personal checks whose face value is in excess of the fees due will be accepted for collection only.

Acceptance.—Payment of the matriculation fee of $10.00 and a deposit on tuition of $50.00 is required of accepted applicants before the expiration date specified in the offer of acceptance. This $60.00 deposit is not returnable and will be forfeited if the applicant fails to register, or it will be applied to the applicant's first semester's charges on registration.

Registration.—All students, after proper certification, are required to register at the Office of the Registrar. (See calendar in front of this bulletin for dates for the payments of fees, and the note regarding late registration fee.)

One-half of the tuition fee, the laboratory fee, the student health fee, the student activities fee, and the maintenance and service fee are payable on the date specified for registration for the first semester.

The remainder of the tuition fee shall be paid on the date of registration for the second semester. Fourth year students shall pay the graduation fee, in addition, at this registration.

PENALTY FOR NON-PAYMENT OF FEES

If semester fees are not paid in full on the specified registration dates, a penalty of $5.00 will be added.

If a satisfactory settlement, or an agreement for settlement, is not made with the Dean within ten days after a payment is due, the student automatically is debarred from attendance on classes and will forfeit the other privileges of the School of Medicine.

* These fees must be paid by students in the Army and Navy training programs. Other students must pay all fees.

REEXAMINATION FEE

A student who is eligible to reexaminations must notify the Dean two weeks in advance of his intention to take the examinations. He will pay the comptroller $5.00 for each subject in which he is to be examined, and he must present the receipt to the faculty member giving the examination before he will be permitted to take the examination.

MAINTENANCE AND SERVICE FEE

This fee pays for the maintenance of loan collections, provides photographs for departmental requests and state board applications, pays room-rent for the third- and fourth-year students when on outside obstetrics, and furnishes student invitations to the Pre-Commencement Exercises.

PERSONAL EXPENSES

The following estimates of personal expenses for the academic year of eight months have been prepared by students, and are based upon actual experience. In addition to these the student must bear in mind the expenditure for a microscope.

	Low	*Average*	*Liberal*
Books	$50	$75	$100
College incidentals	20	20	20
Board, eight months	224	288	352
Room rent	144	184	216
Clothing and laundry	50	80	150
All other expenses	25	50	75
Total	$513	$697	$913

STUDENT HEALTH SERVICE

T. Nelson Carey, M.D. .... Director, Student Health Service

The Medical Council has made provision for the systematic care of students in the Medical School, according to the following plan:

1. *Preliminary Examination*—All new students will be examined during the first week of the semester. Notice of the date, time, and place of the examination will be announced to the classes and on the bulletin board. The passing of this physical examination is necessary before final acceptance of any student.

2. *Medical Attention*—Students in need of medical attention will be seen by the school physician, Dr. T. N. Carey, in his office at the medical school, between 4 and 5 P.M., daily, except Saturday and Sunday. In case of necessity, students will be seen at their homes.

3. *Hospitalization*—If it becomes necessary for any student to enter the hospital during the school year, the school has arranged for the payment of part or all of his hospital expenses, depending on the length of his stay and special expenses incurred. This applies only to students admitted through the school physician's office.

4. *Physical Defects*—Prospective students are advised to have any known

physical defects corrected before entering school in order to prevent loss of time which later correction might incur.

5. *Eye Examination*—Each new matriculate is required to undergo an eye examination at the hands of an oculist (Doctor of Medicine) within three months before entering the School of Medicine. In many students long study hours bring out unsuspected eye defects which cause much loss of time and inefficiency in study if not corrected until after school work is under way.

6. *Limitations*—It is not the function of this service to treat chronic conditions contracted by students before admission, nor to extend treatment to acute conditions arising in the period between academic years, unless the school physician recommends this service.

GENERAL RULES

The right is reserved to make changes in the curriculum, the requirements for graduation, the fees and in any of the regulations whenever the university authorities deem it expedient.

ADVANCEMENT AND GRADUATION

1. All students are required to take the spring examinations unless excused by the Dean.
2. No student will be permitted to pass to a higher class with conditions.
3. Should a student be required to repeat any year in the course, he must pay regular fees.
4. A student failing in final examinations for graduation at the end of the fourth year will be required to repeat the entire course of the fourth year and to take examinations in such other branches as may be required, should he again be permitted to enter the school as a candidate for graduation.
5. The general fitness of a candidate for graduation, as well as the results of his examinations, will be taken into consideration by the faculty.

EQUIPMENT

6. At the beginning of the first year, all students must be prepared to purchase microscopes of a satisfactory type equipped with a mechanical stage and a substage lamp.

A standard microscope of either Bausch & Lomb, Leitz, Spencer, or Zeiss make, fitted with the following attachments, will fill the requirements:

Oculars: 10 x and 5 x.
Triple nose piece with 16 mm., 4 mm., and 1.9 mm. 125 N.A. oil immersion lens.
Wide aperture stage with quick screw condenser.

All used microscopes are subject to inspection and approval before their use in the laboratory is permitted. The student is cautioned against the purchase of such an instrument before its official approval by the school.

7. Students in the second year class are required to provide stethoscopes.

8. Third- and fourth-year students are required to provide haemocytometers, opthalmoscopes and otoscopes.

STATE QUALIFYING CERTIFICATES

9. Candidates for admission who live in or expect to practice medicine in Pennsylvania, New Jersey or New York must file State certificates in the office of the Committee on Admissions, School of Medicine, before registration. No exception will be made to this rule.

EYE EXAMINATION BEFORE ADMISSION

10. Each new matriculate in each class is required to present to the Committee on Admissions a certificate from an oculist, (a graduate in medicine) that the matriculate's eyes have been examined and are in condition, with or without glasses as the case may be, to endure the strain of close and intensive reading.

It is required that this examination be completed within three months prior to registration and that the certificate be mailed to the Committee on Admissions not later than one month before registration.

AWARDING OF COMBINED DEGREES

11. Students entering the School of Medicine on a three-year requirement basis from colleges which usually grant a degree on the successful completion of the first year of medicine, are restricted by the following rule:

> Upon successful completion of the first year in the School of Medicine, and upon recommendation of the Dean of the School of Medicine, the degree of Bachelor of Science may be conferred by a College of Arts and Sciences following the student's *second year* of residence in the School of Medicine.

COST OF TRANSCRIPTS

12. Graduates will receive the first transcript of record without charge. Subsequent copies will cost one dollar each.

PRIZES

THE FACULTY PRIZE

The faculty will award the gold medal and five certificates of honor to those six of the first ten highest ranking candidates for graduation who, during the four academic years, have exhibited outstanding qualifications for the practice of medicine.

THE DR. A. BRADLEY GAITHER MEMORIAL PRIZE

A prize of $25.00 is given each year by Mrs. A. Bradley Gaither as a memorial to the late Dr. A. Bradley Gaither, to the student in the senior class doing the best work in genito-urinary surgery.

SCHOLARSHIPS

All scholarships are assigned for one academic year, unless specifically reawarded on consideration of an application.

Official application forms are obtainable at the Dean's office, where they should be filed two months before the ensuing academic year.

THE DR. SAMUEL LEON FRANK SCHOLARSHIP

(Value $100.00)

This scholarship was established by Mrs. Bertha Rayner Frank as a memorial to the late Dr. Samuel Leon Frank, an alumnus of this university.

It is awarded by the Trustees of the Endowment Fund of the University each year upon nomination by the Faculty Board "to a medical student of the University of Maryland, who in the judgment of said Council, is of good character and in need of pecuniary assistance to continue his medical course."

This scholarship is awarded to a second, third or fourth year student who has successfully completed one year's work in this school. No student may hold this scholarship for more than two years.

THE CHARLES M. HITCHCOCK SCHOLARSHIPS

(Value $100.00 each)

Two scholarships were established from a bequest to the School of Medicine by the late Charles M. Hitchcock, M.D., an alumnus of the university.

These scholarships are awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to students who have meritoriously completed the work of at least the first year of the course in medicine, and who present to the council satisfactory evidence of a good moral character and of inability to continue the course without pecuniary assistance.

THE RANDOLPH WINSLOW SCHOLARSHIP

(Value $100.00)

This scholarship was established by the late Randolph Winslow, M.D., LL.D.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon nomination by the Faculty Board, to a "needy student of the Senior, Junior, or Sophomore Class of the Medical School."

"He must have maintained an average grade of 85% in all his work up to the time of awarding the scholarship."

"He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance."

THE DR. LEO KARLINSKY MEMORIAL SCHOLARSHIP

(Value $125.00)

This scholarship was established by Mrs. Ray Mintz Karlinsky as a memorial to her husband, the late Dr. Leo Karlinsky, an alumnus of the university.

It is awarded annually by the Trustees of the Endowment Fund of the University, upon the nomination of the Faculty Board, to "a needy student of the Senior, Junior or Sophomore Class of the Medical School."

He must have maintained in all his work up to the time of awarding the scholarship a satisfactory grade of scholarship.

He must be a person of good character and must satisfy the Faculty Board that he is worthy of and in need of assistance.

THE UNIVERSITY SCHOLARSHIP

A scholarship which entitles the holder to exemption from payment of tuition fee for the year, is awarded annually by the Faculty Board to a student of the senior class in need of assistance who presents to the Faculty Board satisfactory evidence of good character and scholarship.

THE FREDERICA GEHRMANN SCHOLARSHIP

(Value $200.00)

(Not open to holders of Warfield and Cohen Scholarships)

This scholarship was established by the bequest of the late Mrs. Frederica Gehrmann and is awarded to a third-year student who at the end of the second year has passed the best practical examinations in physiology, pharmacology, pathology, bacteriology, immunology, serology, surgical anatomy and neuroanatomy.

THE CLARENCE AND GENEVRA WARFIELD SCHOLARSHIPS

(Value $300.00 each)

There are five scholarships established by the regents from the income of the fund bequeathed by the will of Dr. Clarence Warfield.

Terms and Conditions: These scholarships are available to students of any of the classes of the course in medicine. Preference is given to students from the counties of the state of Maryland which the Faculty Board may from time to time determine to be most in need of medical practitioners.

Any student receiving one of these scholarships must agree, after graduation and a year's internship, to undertake the practice of medicine, for a term of two years, in the county to which the student is accredited, or in a county selected by the Board. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded by the student.

THE ISRAEL AND CECELIA E. COHEN SCHOLARSHIP

(Value $150.00)

This scholarship was established by the late Eleanor S. Cohen in memory of her parents, Israel and Cecelia E. Cohen. Terms and conditions: This scholarship will be available to students of any one of the classes of the course in medicine; preference is given to students of the counties in the state of Maryland which the

Faculty Board may from time to time determine to be most in need of medical practitioners. Any student receiving one of these scholarships must, after graduation and a year's internship, agree to undertake the practice of medicine for a term of two years in the county to which the student is accredited, or in a county selected by the council. In the event that a student is not able to comply with the condition requiring him to practice in the county to which he is accredited by the Board, the money advanced by the regents shall be refunded.

THE DR. HORACE BRUCE HETRICK SCHOLARSHIP

(Value $125.00)

This scholarship was established by Dr. Horace Bruce Hetrick as a memorial to his sons, Bruce Hayward Hetrick and Augustus Christian Hetrick. It is to be awarded by the Faculty Board to a student of the senior class.

THE MEDICAL ALUMNI ASSOCIATION SCHOLARSHIP

(Value $300.00)

This scholarship was established by The Medical Alumni Association of the University of Maryland.

It is awarded, on recommendations of the Board of Directors of the Medical Alumni Association and of the Chairman of the Committee on Admissions of the School of Medicine, to a student of the first year who must furnish satisfactory evidence of good character and scholastic accomplishment and of his inability to pursue the medical course without pecuniary support.

THE HENRY ROLANDO SCHOLARSHIP

(Value approximately $250.00)

The Henry Rolando Scholarship was established by the Board of Regents of the University of Maryland from a bequest to the Board by the late Anne H. Rolando for the use of the Faculty of Medicine.

This scholarship will be awarded each academic year on the recommendation of the Faculty Board to a "poor and deserving student."

LOAN FUNDS

W. K. KELLOGG FUND

This loan fund was established for the academic year 1942 with money granted by the W. K. Kellogg Foundation. The interest paid on the loans made will be allowed to accumulate for five years. This, together with the principal of the fund, as repaid, will be used to found a rotating loan fund. Loans will be made on the basis of need, character and scholastic attainment.

FACULTY OF MEDICINE LOAN FUND

A Faculty of Medicine Loan Fund was established with money derived from the bequest of Dr. William R. Sanderson, Class 1882, and the gift of Dr. Albert Stein, Class 1907. Loans will be made on the basis of need, character, and scholastic ability.

ORGANIZATION OF THE CURRICULUM

The following curriculum is the result of a thorough revision of teaching in this school in order to meet modern requirements. The multiplication of specialties in medicine and surgery necessitates a very crowded course and the introduction of electives will very soon be depended on to solve some of the difficulties.

The curriculum is organized under twelve departments.

1. Anatomy (including Histology and Embryology).
2. Physiology.
3. Bacteriology and Immunology.
4. Biological Chemistry.
5. Pharmacology and Materia Medica.
6. Pathology.
7. Medicine (including Medical Specialties).
8. Surgery (including Surgical Specialties).
9. Obstetrics.
10. Gynecology.
11. Ophthalmology.
12. Roentgenology.

The instruction is given in four academic years of graded work.

Several courses of study extend through two years or more, but in no case are the students of different years thrown together in the same course of teaching.

The first and second years are devoted largely to the study of the structures and functions of the normal body. Laboratory work occupies most of the student's time during these two years.

Some introductory instruction in medicine and surgery is given in the second year. The third and fourth years are almost entirely clinical.

A special feature of instruction in the school is the attempt to bring together teacher and student in close personal relationship. In many courses of instruction the classes are divided into small groups and a large number of instructors insures attention to the requirements of each student.

In most courses the final examination as the sole test of proficiency has disappeared and the student's final grade is determined largely by partial examinations, recitations and assigned work carried on throughout the course.

DEPARTMENT OF GROSS ANATOMY

Eduard Uhlenhuth	Professor of Anatomy
Frank H. J. Figge	Associate Professor of Gross Anatomy
James C. Plagge	Assistant Professor of Gross Anatomy
Otto C. Brantigan	Assistant Professor of Gross Anatomy and Associate in Surgery
F. Gaynor Evans	Assistant Professor of Gross Anatomy
E. Eugene Covington	Associate in Gross Anatomy and Surgery
Vernon E. Krahl	Instructor in Gross Anatomy
★Harry C. Hull	Associate in Surgery

Thurston R. Adams	Instructor in Gross Anatomy and Surgery
★Harry A. Teitelbaum	Instructor in Gross Anatomy
W. W. Walker	Instructor in Gross Anatomy and Surgery
★Herbert E. Reifschneider	Assistant in Surgery
★Harry C. Bowie	Assistant in Gross Anatomy and Surgery
William B. Settle	Assistant in Gross Anatomy and Instructor in Gynecology
Robert D. Duncan	Assistant in Gross Anatomy and Surgery
Milton L. Solomon	Research Associate in Gross Anatomy

Gross Anatomy. *First Year.* Six lectures and conferences and seventeen hours of laboratory (dissection of the human subject) are given each week during the first semester. Drs. Uhlenhuth, Figge, Evans and Krahl.

Total hours: 350.

Topographic and Surgical Anatomy. *Second Year.* The course is designed to bridge the gap between abstract anatomy and clinical anatomy as applied to the study and practice of medicine and surgery. Students are required to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods are given each week during the second semester. Drs. Brantigan, Covington, Adams, Walker, Settle and Duncan.

Total hours: 96.

Advanced Anatomy (*elective course*). Selected problems in gross anatomy. This course is intended to offer to the sophomore student an opportunity of extending the knowledge secured in the freshman course. Drs. Uhlenhuth, Figge, Evans and Brantigan.

Total hours: 64.

In addition to the above course, facilities for special anatomical problems are offered to the more advanced student and physician.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

Carl L. Davis	Professor of Anatomy
O. G. Harne	Associate Professor of Histology
John F. Lutz	Assistant Professor of Histology
Walter L. Hard	Assistant Professor of Histology

First Year. The course in histology is divided equally between the study of the fundamental tissues and that of organs. Throughout the entire course the embryology of the part being studied precedes the study of the fully developed tissue. Thus embryology becomes a correlated part of the whole subject of microscopic anatomy and not an independent subject.

Each student is furnished a set of histological slides, previously prepared in our own laboratory, thus insuring a uniform and satisfactory quality of material for study and permitting the time of the student to be expended in the study of material rather than in the technic of its preparation. The object of the course is to present the evidence of function as shown by the structure of tissues and organs. Drs. Davis, Lutz, Harne, and Hard.

An optional laboratory course is offered. This supplements the required course giving laboratory experience which can not be incorporated in the former. No added charge is made for the course.

Total hours: 150.

NEURO-ANATOMY

First Year. Neuro-anatomy embraces a study of the fundamental structure of the central nervous system as applied to its function. An abundance of material permits of individual dissection of the human brain. A series of appropriately stained sections of the human brain stem is furnished each student for the microscopic study of the internal structure of the nervous system. Drs. Davis, Lutz, Harne, and Hard.

Total hours: 100.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PHYSIOLOGY

William R. Amberson	Professor of Physiology
Dietrich Conrad Smith	Associate Professor of Physiology
Robert H. Oster	Associate Professor of Physiology
Rubert S. Anderson	Assistant Professor of Physiology
Joye E. Jacobs	Instructor in Physiology
Mary E. Chinn	Assistant in Physiology
C. Martin Rhode	Weaver Fellow in Physiology
Dorothy Bizzell	American Philosophical Society Fellow in Physiology

Five lectures, one conference and two laboratory periods a week, 1st semester of each academic year. The fundamental concepts of physiology are presented with special reference to mammalian problems.

Total hours: 224.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF BACTERIOLOGY AND IMMUNOLOGY

Frank W. Hachtel	Professor of Bacteriology
James G. McAlpine	Associate Professor of Bacteriology
★Henry F. Buettner	Instructor in Bacteriology
H. Edmund Levin	Instructor in Bacteriology

The principles of general bacteriology are taught by quiz, conference, and lecture.

Instruction in bacteriology is given in the laboratory to students of the second year class during the first semester. This includes the methods of preparation of culture media, the study of pathogenic bacteria, and the bacteriological examination of water and milk. The bacteriological diagnosis of communicable diseases is also included.

The principles of immunology are presented by means of quizzes, conferences and lectures to the second year class in the second semester.

The course includes a consideration of infection and immunity, the nature and action of the various antibodies, complement fixation and flocculation tests, hypersensitiveness, and the preparation of bacterial vaccines.

Experiments are carried out by the class in the laboratory. During the latter half of the semester the class is divided into sections.

Total hours: Bacteriology 120.
Immunology 72.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF BIOLOGICAL CHEMISTRY

H. Boyd Wylie	Professor of Biological Chemistry
Emil G. Schmidt	Associate Professor of Biological Chemistry
Glenn S. Weiland	Assistant Professor of Biological Chemistry
Frank N. Ogden	Associate in Biological Chemistry
Ann Virginia Brown	Instructor in Biological Chemistry
Jane Louise Banker	Weaver Fellow in Biochemistry

This course is designed to present the principles of biological chemistry and to indicate their applications to the clinical aspects of medicine. The phenomena of living matter and its chief ingredients, secretions and excretions are discussed in lectures and conferences and examined experimentally. Training is given in biochemical methods of investigation. Total hours: 208.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PHARMACOLOGY

John C. Krantz, Jr.	Professor of Pharmacology
C. Jelleff Carr	Associate Professor of Pharmacology
William Ellsworth Evans, Jr.	Assistant Professor of Pharmacology
Ruth Musser	Instructor in Pharmacology
Henry L. Wollenweber	Assistant in Pharmacology
William G. Harne	Demonstrator in Pharmacology
Frederick K. Bell	U. S. Pharmacopoeia Fellow
Edith J. Wiegand	Fellow in Pharmacology
Dorothy Kibler	Fellow in Pharmacology

This course is designed to include those phases of pharmacology necessary for an intelligent use of drugs in the treatment of disease. The didactic instruction includes materia medica, pharmacy, prescription-writing, toxicology, posology, pharmacodynamics, and experimental therapeutics. The laboratory exercises parallel the course of lectures.

In addition, optional conference periods and lectures are available for students desiring further instruction or advice.

Total hours: 192.

Graduate Courses. Consult the catalogue of the Graduate School for descriptions of the graduate courses offered by members of the staff.

DEPARTMENT OF PATHOLOGY

Hugh R. Spencer	Professor of Pathology
Robert B. Wright	Associate Professor of Pathology
C. Gardner Warner	Associate Professor of Pathology
★Walter C. Merkel	Assistant Professor of Pathology
★D. James Greiner	Assistant Professor of Pathology
Howard J. Maldeis	Associate in Pathology
Albert E. Goldstein	Associate in Pathology
Frank B. Kindell	Associate in Pathology
★William S. Love, Jr.	Instructor in Pathology
Leon Freedom	Instructor in Pathology
Milton S. Sacks	Instructor in Pathology
Henry L. Wollenweber	Instructor in Pathology
★Edward F. Cotter	Instructor in Pathology
John A. Wagner	Instructor in Pathology
★Conrad B. Acton	Assistant in Pathology
★Howard B. Mays	Assistant in Pathology
★Ephriam T. Lisansky	Assistant in Pathology
★Karl F. Mech	Assistant in Pathology
Dexter L. Reimann	Assistant in Pathology
Benedict Skitarelic	Assistant in Pathology
D. McClelland Dixon	Assistant in Pathology

Courses of instruction in Pathology are given during the second and third years. The courses are based on the previous study of normal structure and function and aim to outline the history of disease. The relationship between clinical symptoms and anatomical lesions is constantly stressed.

General Pathology. *Second Semester, Second Year.* This course includes the study of disturbances of the body fluids; disturbances of structure, nutrition and metabolism of cells; disturbances of fat, carbohydrate and protein metabolism; disturbances of pigment metabolism; inflammation and tumors.

Laboratory instruction is based on the study of prepared slides (loan collection) and corresponding gross material.

Applied Pathology, Including Gross Morbid Anatomy and Morbid Physiology. *Third Year.* The laboratory instruction in this course is carried out in small teaching museums where prepared specimens and material from autopsies with clinical histories and sections are available for study. For this work the class is divided into small groups. Clinical correlation is stressed.

Autopsies. *Third Year.* Students in small groups attend autopsies at the morgues of the University Hospital and the Baltimore City Hospitals.

Clinical-Pathological Conference. (*Fourth Year.*) These exercises are held in collaboration with the Department of Medicine. Selected cases are discussed and autopsy findings are presented.

Second year	184 hours
Third year	160 hours
Fourth year	30 hours
Total	374 hours

DEPARTMENT OF MEDICINE

★Maurice C. Pincoffs	Professor of Medicine
Thomas P. Sprunt	Acting Head of the Department of Medicine and Professor of Clinical Medicine
Jos. E. Gichner	Professor of Clinical Medicine and Physical Therapeutics
G. Carroll Lockard	Professor of Clinical Medicine
Harvey G. Beck	Professor of Clinical Medicine
H. Raymond Peters	Professor of Clinical Medicine
Paul W. Clough	Associate Professor of Medicine
Sydney R. Miller	Associate Professor of Medicine
Walter A. Baetjer	Associate Professor of Medicine
★Wm. S. Love, Jr.	Associate Professor of Medicine
★Raymond Hussey	Associate Professor of Medicine
★Louis A. M. Krause	Associate Professor of Medicine
T. Nelson Carey	Associate Professor of Medicine
William H. Smith	Associate Professor of Clinical Medicine
H. J. Maldeis	Associate Professor of Medical Jurisprudence
George McLean	Assistant Professor of Medicine
John E. Legge	Assistant Professor of Medicine
Thomas C. Wolff	Assistant Professor of Medicine
H. M. Bubert	Assistant Professor of Medicine
J. S. Eastland	Assistant Professor of Medicine
Milton S. Sacks	Assistant Professor of Medicine
★Lewis P. Gundry	Assistant Professor of Medicine
Charles R. Goldsborough	Lecturer in Medicine
W. N. Bispham, Col., M. C., U. S. A. (ret.)	Lecturer in Medicine
Clark H. Yeager	Lecturer in Tropical Medicine
Wetherbee Fort	Associate in Medicine
Frank J. Geraghty	Associate in Medicine
E. H. Tonolla	Associate in Medicine
★H. Vernon Langeluttig	Associate in Medicine
Sol Smith	Associate in Medicine
★Samuel T. Helms	Instructor in Medicine
David Tenner	Instructor in Medicine
★R. B. Mitchell, Jr.	Instructor in Medicine
Samuel Legum	Instructor in Medicine
M. S. Shiling	Instructor in Medicine
H. Edmund Levin	Instructor in Medicine
Robert A. Reiter	Instructor in Medicine
W. Grafton Hersperger	Instructor in Medicine
Meyer W. Jacobson	Instructor in Medicine
★Conrad Acton	Instructor in Medicine
★Hugh G. Whitehead	Instructor in Medicine
★Philip D. Flynn	Instructor in Medicine
★Edward S. Kallins	Instructor in Medicine
★Irving Freeman	Instructor in Medicine
John A. Myers	Instructor in Medicine
Kurt Levy	Instructor in Medicine
★William G. Helfrich	Instructor in Medicine
★Francis G. Dickey	Instructor in Medicine
C. Edward Leach	Instructor in Medicine
Lawrence M. Serra	Instructor in Medicine

Marie A. Andersch	Instructor in Medicine
★W. H. Triplett	Assistant in Medicine
Morris Fine	Assistant in Medicine
William H. Grenzer	Assistant in Medicine
★George Silverton	Assistant in Medicine
★Lawrence Katzenstein	Assistant in Medicine
Leon Ashman	Assistant in Medicine
★Harry M. Robinson, Jr.	Assistant in Medicine
Nathaniel M. Beck	Assistant in Medicine
★Joseph M. Blumberg	Assistant in Medicine
★Paul E. Carliner	Assistant in Medicine
Samuel Snyder	Assistant in Medicine
★S. Edwin Muller	Assistant in Medicine
Louis J. Kroll	Assistant in Medicine
★John L. Atkins	Assistant in Medicine
★William K. Waller	Assistant in Medicine
★Ephraim T. Lisansky	Assistant in Medicine
★Nachman Davidson	Assistant in Medicine
Richard N. Tillman	Assistant in Medicine
★Samuel T. R. Revell, Jr	Assistant in Medicine
★Arthur Karfgin	Assistant in Medicine
★Joseph E. Muse, Jr.	Assistant in Medicine
Daniel Wilfson, Jr.	Assistant in Medicine
★Joseph B. Gross	Assistant in Medicine
Samuel J. Hankin	Assistant in Medicine
Anthony F. Carozza	Assistant in Medicine
★Robert C. Crawford	Assistant in Medicine
★Charles W. Knerler	Assistant in Medicine
★Edwin O. Daue, Jr.	Assistant in Medicine
★Robert L. Gibbs	Assistant in Medicine
★James R. Karns	Assistant in Medicine
★Robert B. Mearns	Assistant in Medicine
★William H. Kammer, Jr.	Assistant in Medicine
★Donald J. Roop	Assistant in Medicine
Benjamin Skitaleric	Assistant in Medicine
L. Ann Hellen	Assistant in Medicine
★Frederick J. Vollmer	Hitchcock Fellow in Medicine
Leslie Harrell Pierce	Hitchcock Fellow in Medicine

GENERAL OUTLINE

Second Year

Introduction to clinical medicine.

(a) Introductory physical diagnosis. (1 hour a week, first semester; 2 hours a week, second semester.)

(b) Medical clinics. (1 hour a week, second semester.)

Third Year

I. The methods of examination (13 hours a week). (a) History taking. (b) Physical diagnosis. (c) Clinical pathology.

These subjects are taught and practiced in the hospital out-patient department and in the clinical laboratory.

II. The principles of medicine (200 hours).
  (a) Lectures, clinics and demonstrations in general medicine, neurology, pediatrics, psychiatry and preventive medicine.
III. The principles of therapeutics (15 hours). Lectures and demonstrations.

Fourth Year

The practice of medicine.
I. Clinical clerkship on the medical wards. (26 hours a week for ten weeks.)
  (a) Responsibility, under supervision, for the history, physical examination, laboratory examinations and progress notes of assigned cases.
  (b) Ward classes in general medicine, the medical specialties, and therapeutics.
II. Clinics in general medicine and the medical specialties.
  (6 hours a week.)
III. Dispensary work in the medical specialties.
IV. Clinical-pathological conferences (1 hour a week).

MEDICAL DISPENSARY WORK

The medical dispensaries of both the Mercy and the University Hospitals are utilized for teaching in the third year. Each student spends two hours daily for ten weeks in dispensary work. The work is done in groups of four to six students under an instructor. Systematic history-taking is especially stressed. Physical findings are demonstrated. The student becomes familiar with the commoner acute and chronic disease processes.

PHYSICAL DIAGNOSIS

Second Year. Didactic lectures and practical demonstrations in topographical anatomy and normal physical signs. Dr. McLean.

Third Year. The class is divided into small groups, and each section receives instruction for two hours daily for ten weeks. This course is given at the Baltimore City Hospitals. The large clinical material there is utilized to give each student the opportunity to familiarize himself with the common types of bodily structure, with the normal variations in physical signs and with the physical signs of the chief pulmonary, circulatory and abdominal diseases. A course of lectures (1 hour a week) on physical diagnosis supplements the practical work in this subject. Drs. Wolff, Reiter, Ashman, Kroll, Legum and Wilfson.

THERAPEUTICS

Third Year. General therapeutics and materia medica are taken up and an effort is made to familiarize the student with the practical treatment of disease. The special therapy of the chief diseases is then reviewed. One hour a week. Dr. Lockard.

Fourth Year. Special consideration is given to the practical application of therapeutic principles in bedside teaching and the chief therapeutic methods are demonstrated.

Students attend therapeutic ward rounds once a week throughout their medical trimester.

TROPICAL MEDICINE

Certain phases of tropical medicine are considered in the course on Clinical Pathology. In addition, Dr. Clark H. Yeager conducts a course of lectures and demonstrations to the entire fourth year class. The course occupies one hour weekly for twenty weeks.

TUBERCULOSIS

During the third year in connection with the instruction in physical diagnosis a practical course is given at the Municipal Tuberculosis Hospital. Stress is laid upon the recognition of the physical signs of the disease, as well as upon its symptomatology and gross pathology.

CARDIOLOGY

In the third year a series of lectures and clinics correlated with pathological studies is given the entire class.

During the fourth year an elective course in cardiology is offered at the Mercy Hospital. The course occupies one and one-half hours weekly. Physical diagnosis, electocardiography and the therapeutic management of cardiac cases are stressed.

Elective outpatient work is available also to members of the fourth year class in the Cardiac Clinic of the University Hospital.

SYPHILIS

Third Year. During the third year the subject of syphilis is dealt with in the lecture course.

Fourth Year. An elective course in the therapeutic management of syphilis is offered in the dispensary.

CLINICAL PATHOLOGY

Milton S. Sacks	Assistant Professor of Medicine and Head of Department of Clinical Pathology
H. Raymond Peters	Professor of Clinical Medicine
★Samuel T. Helms	Instructor in Medicine
John A. Myers	Instructor in Medicine
Marie A. Andersch	Biochemist, University Hospital, Instructor in Medicine
★Hugh G. Whitehead	Assistant in Medicine
★Joseph M. Blumberg	Assistant in Medicine
★S. Edwin Muller	Assistant in Medicine
John A. Wagner	Assistant in Medicine
Sol Smith	Assistant in Medicine
Dexter L. Reimann	Assistant in Medicine
Benedict Skitaleric	Assistant in Medicine
L. Ann Hellen	Assistant in Medicine

During the third year the student is thoroughly drilled in the technic of the usual clinical laboratory work, so that he is able to perform all routine examinations which may be called for during his fourth year, in connection with the work in the wards and dispensary.

The practical work is supplemented by a series of didactic lectures and demonstrations in which the entire teaching staff of the department takes an active part. The microscopical and chemical study of blood, exudates and transudates, gastric juice, spinal fluid, feces and urine are successively taken up, and special attention directed to the clinical significance of the findings.

Clinical parasitology from the standpoint of the infecting agent and the carrier is given careful consideration.

The entire course is thoroughly practical. Each student provides his own microscope and blood counters and is supplied a haemoglobinometer for his exclusive use. Every two students are equipped with a special laboratory outfit for all routine purposes.

During the fourth year the student applies in the laboratories of the various affiliated hospitals what he has learned during the preceding year. He is also supplied with a laboratory outfit which is sufficiently complete to enable him to work independently of the general equipment. Special instructors are available during certain hours to give necessary assistance and advice.

GASTRO-ENTEROLOGY

Theodore H. Morrison	Clinical Professor of Gastro-Enterology
Maurice Feldman	Assistant Professor of Gastro-Enterology
Zachariah Morgan	Assistant Professor of Gastro-Enterology
★Samuel Morrison	Assistant Professor of Gastro-Enterology
Joseph Sindler	Associate in Gastro-Enterology
Z. Vance Hooper	Associate in Gastro-Enterology
Albert J. Shochat	Instructor in Gastro-Enterology
★Francis G. Dickey	Instructor in Medicine
John A. Myers	Assistant in Gastro-Enterology
Nathaniel M. Beck	Assistant in Gastro-Enterology

Third Year. A series of six lectures is given on the diseases of the digestive tract.

Fourth Year. Clinics and demonstrations are given to the class for one hour a week; dispensary instruction to small groups throughout the entire session. Practical instruction is given in the use of modern methods of study of the diseases of the gastro-intestinal tract.

PSYCHIATRY

Ross McC. Chapman	Professor of Psychiatry
Ralph P. Truitt	Associate Professor of Psychiatry
Lawrence F. Woolley	Associate Professor of Psychiatry
★Harry Goldsmith	Assistant Professor of Psychiatry
★H. W. Newell	Assistant Professor of Psychiatry
Harry M. Murdock	Assistant Professor of Psychiatry
Leslie B. Hohman	Lecturer in Psychiatry
★A. Russell Anderson	Instructor in Psychiatry
★Philip S. Wagner	Instructor in Psychiatry
Charles Schmidt	Instructor in Psychiatry
Hans W. Loewald	Instructor in Psychiatry
★Sidney Berman	Fellow in Psychiatry

First Year. The student attends six lectures dealing with the development and function of the normal personality.

Second Year. The student attends fourteen demonstration lectures on psychopathology.

Third Year. Six hours are devoted to the demonstration of clinical psychopathology; six hours are given to clinical presentation of the psychoses; twelve hours are used for clinical lectures with demonstration and discussion of the management of psychiatric problems encountered in the general practice of medicine; thirty hours are given to history-taking and study of patients in the out-patient clinic.

Fourth Year. The neuroses, psychoneuroses and psychoses are dealt with in ten hours of lectures and demonstrations. In this year the class is divided into sections for clinical conferences on selected cases.

PEDIATRICS

C. Loring Joslin	Professor of Pediatrics
Edgar B. Friedenwald	Professor of Clinical Pediatrics
★T. Campbell Goodwin	Associate Professor of Pediatrics
John H. Traband	Assistant Professor of Pediatrics
Albert Jaffe	Assistant Professor of Pediatrics
A. H. Finkelstein	Assistant Professor of Pediatrics
Frederick B. Smith	Assistant Professor of Pediatrics
J. Edmund Bradley	Assistant Professor of Pediatrics
Clewell Howell	Associate in Pediatrics
Samuel S. Glick	Associate in Pediatrics
F. Stratner Orem	Associate in Pediatrics
William M. Seabold	Associate in Pediatrics
G. Bowers Mansdorfer	Associate in Pediatrics
★M. Paul Byerly	Instructor in Pediatrics
★Jerome Fineman	Instructor in Pediatrics
★B. Matthew Debuskey	Instructor in Pediatrics
★Gibson J. Wells	Instructor in Pediatrics
W. J. Schmitz	Assistant in Pediatrics
★Israel P. Meranski	Assistant in Pediatrics
★Lauriston L. Keown	Assistant in Pediatrics
★Earle S. Scott	Assistant in Pediatrics
William E. Weeks	Assistant in Pediatrics
William C. Lowe	Assistant in Pediatrics
Thomas A. Hedrick	Assistant in Pediatrics

Third Year. The course is presented as follows:

Lectures on infant feeding and the fundamentals of diseases of infants and children. (15 hours.)

Lectures on contagious diseases in conjunction with the Department of Hygiene and Preventive Medicine. (14 hours.)

A special course in physical diagnosis is given at City Hospitals. (20 hours.)

Clinical conferences demonstrating diseases of the newly-born. (6 hours.)

Fourth Year. An amphitheatre clinic is given at which patients are shown to demonstrate the features of the diseases discussed. (30 hours.)

Conferences and demonstrations are given in problems concerning diagnosis, care, treatment and clinical pathology of the diseases of infants and children. (30 hours.)

Students are assigned subjects for the preparation of theses.

Clinical clerkships are assigned on the pediatric wards, where experience is gained in taking histories, making physical examinations, doing routine laboratory work, and following up the patients' progress. This is under the supervision of the visiting staff. (140 hours.)

Instruction is given in the pediatric clinic of the out-patient department of the University Hospital. This consists of 1½ hours daily for five weeks—30 minutes each day being devoted to a clinical demonstration of some interesting case by a member of the staff; one hour daily to taking histories and making physical examinations under supervision of one of the staff instructors. (45 hours.)

Total hours: 300.

NEUROLOGY

Irving J. Spear	Professor of Neurology
Andrew C. Gillis	Professor of Neurology
Leon Freedom	Associate Professor of Neurology
Benjamin Pushkin	Assistant Professor of Neurology
Philip F. Lerner	Instructor in Neurology
★William L. Fearing	Instructor in Neurology
★Edward F. Cotter	Assistant in Neurology
★Harry B. Teitelbaum	Assistant in Neurology
John W. Machen	Assistant in Neurology
George C. Mediary	Assistant in Neurology

Second Year. Fifteen one-hour lectures are given to correlate the anatomy and physiology of the nervous system with clinical neurology.

Third Year. Twenty hours of instruction are given to the whole class in neuropathology supplemented with pathological demonstrations. Sixteen lecture-demonstrations are given in which the major types of the diseases of the nervous system are discussed. A course is also given at the Baltimore City Hospitals, comprising eight periods of two hours each, in which the students in small groups carry out complete neurological examinations of selected cases which illustrate the chief neurological syndromes.

Fourth Year. A clinical conference one hour each week is given to the whole class at the University and Mercy Hospitals. All patients presented at these clinics are carefully examined. Complete written records are made by the students who demonstrate the patients before the class. The patients are usually assigned one or two weeks before they are presented, and each student in the class must study and present one or more patients during the year.

Ward Class Instruction. Nine hours of instruction are given to each student in small sections at the University and Mercy Hospitals. In these classes the students come in close personal contact with the patients in the wards under the supervision of the instructor.

Dispensary Instruction. Small sections are instructed in the dispensaries of the University and Mercy Hospitals five afternoons each week. In this way students are brought into contact with nervous diseases in their early and late manifestations.

HYGIENE AND PUBLIC HEALTH

HUNTINGTON WILLIAMS	Professor of Hygiene and Public Health
WILLIAM H. F. WARTHEN	Assistant Professor of Hygiene and Public Health
ROSS DAVIES	Assistant Professor of Hygiene and Public Health
MYRON G. TULL	Instructor in Hygiene and Public Health

Third Year. A one-hour lecture is given to the whole class each Monday during both semesters. Basic instruction is afforded in the clinical and public health aspects of the communicable diseases including syphilis and tuberculosis. The lectures are under the auspices of the Department of Medicine and are given by staff members of that department, including physicians representing pediatrics, hygiene and public health, and the Baltimore City Health Department.

Fourth Year. Six one-hour lectures are given to the whole class at the beginning of the first semester and are on important public health procedures such as maternal and child hygiene, sewage disposal, vital statistics, interstate and international quarantine and research in public health. Elective work is also assigned at Sydenham Hospital, the one-hundred bed communicable disease hospital of the City Health Department, and at the Western Health District. The course deals with the fundamentals of public health and supplements the work in the third year.

The major emphasis in both years is on the practice of preventive medicine and the relation of prevention to diagnosis and treatment.

Note. Because of the acceleration of the wartime curriculum it has been necessary to discontinue temporarily the following instruction in the fourth year: (1) two-hour seminar periods for the whole class, in groups of ten to fifteen students on six Wednesday afternoons. These sessions enabled the students themselves to prepare birth and death certificates and to understand a selected group of laboratory and sanitary procedures of a practical nature. (2) Four Wednesday afternoon field inspection trips for each third of the class. These trips, under guidance of full time public health workers, included visits to the city water filtration plant, the sewage disposal plant, a milk pasteurization plant and bakery and an industrial plant which has an active program of hygiene.

LEGAL MEDICINE

HOWARD J. MALDEIS	Associate Professor of Legal Medicine Chief Medical Examiner, Maryland

Third Year. This course embraces a summary of some of the following: Proceedings in criminal and civil prosecution, medical evidence and testimony, identity and its general relations, personal identity, rape, criminal abortions, signs of death, wounds in their medico-legal relations, natural and homicidal death, malpractice, insanity, and medico-legal autopsies.

Total hours: 3.

DEPARTMENT OF SURGERY

ARTHUR M. SHIPLEY	Professor of Surgery
★WALTER D. WISE	Professor of Surgery
PAGE EDMUNDS	Professor of Traumatic Surgery
CHARLES BAGLEY, JR.	Professor of Neurological Surgery
ELLIOTT H. HUTCHINS	Professor of Clinical Surgery

Charles Reid Edwards	Professor of Clinical Surgery
Thomas B. Aycock	Professor of Clinical Surgery
★D. J. Pessagno	Clinical Professor of Surgery
★Monte Edwards	Clinical Professor of Surgery
Thomas R. Chambers	Associate Professor of Surgery
R. W. Locher	Associate Professor of Clinical Surgery
Edward S. Johnson	Associate Professor of Surgery
Charles A. Reifschneider	Associate Professor of Traumatic Surgery
★N. Clyde Marvel	Associate Professor of Surgery
Richard G. Coblentz	Associate Professor of Neurological Surgery
Grant E. Ward	Associate Professor of Surgery
Cyrus F. Horine	Associate Professor of Surgery
Charles W. Maxson	Associate Professor of Surgery
★George H. Yeager	Assistant Professor of Surgery
H. F. Bongardt	Assistant Professor of Surgery
★Henry F. Ullrich	Assistant Professor of Surgery
I. O. Ridgley	Associate in Surgery
C. W. Peake	Associate in Surgery
Edward A. Kitlowski	Associate in Plastic Surgery
James W. Nelson	Associate in Surgery
★I. Ridgeway Trimble	Associate in Surgery
★Richard T. Shackelford	Associate in Surgery
★Simon H. Brager	Associate in Surgery
Raymond F. Helfrich	Associate in Surgery
★Harry C. Hull	Associate in Surgery
Otto C. Brantigan	Associate in Surgery
E. Eugene Covington	Associate in Surgery
William R. Johnson	Instructor in Surgery
E. M. Hanrahan	Instructor in Surgery
S. Demarco	Instructor in Surgery
★Karl J. Steinmueller	Instructor in Surgery
Luther E. Little	Instructor in Surgery
J. Frank Hewitt	Instructor in Surgery
★Murray M. Copeland	Instructor in Surgery
J. Duer Moores	Instructor in Surgery
Thurston R. Adams	Instructor in Surgery
★Arthur G. Siwinski	Instructor in Surgery
Calvin B. Hyman	Instructor in Surgery
W. W. Walker	Instructor in Surgery
William R. Geraghty	Assistant in Surgery
Howard B. McElwain	Assistant in Surgery
A. V. Buchness	Assistant in Surgery
T. J. Touhey	Assistant in Surgery
Clyde F. Karns	Assistant in Surgery
Samuel H. Culver	Assistant in Surgery
Albert R. Wilkerson	Assistant in Surgery
L. T. Chance	Assistant in Surgery
Samuel McLanahan, Jr.	Assistant in Surgery
W. Allen Deckert, Jr.	Assistant in Surgery
★Samuel E. Proctor	Assistant in Surgery
George Govatos	Assistant in Surgery

Dwight M. Currie	Assistant in Surgery
Robert F. Healy	Assistant in Surgery
Herbert M. Foster	Assistant in Surgery
★Daniel R. Robinson	Assistant in Surgery
Robert F. Chenowith	Assistant in Surgery
★Joseph V. Jerardi	Assistant in Surgery
Eldred Roberts	Assistant in Surgery
★Donald B. Grove	Assistant in Surgery
★William S. Cheney	Assistant in Surgery
★Herbert E. Reifschneider	Assistant in Surgery
★George H. Brouillet	Assistant in Surgery
★Harry C. Bowie	Assistant in Surgery
★William M. Garlick	Assistant in Surgery
★Frederick W. Waknitz	Assistant in Surgery
★Stuart G. Coughlan	Assistant in Surgery
William B. Settle	Assistant in Surgery
★Clarence P. Scarborough	Assistant in Surgery
Harold H. Burns	Assistant in Surgery
★Ernest W. Mack	Assistant in Surgery
★Hugh H. Trout, Jr.	Assistant in Surgery
★Henry L. Rigdon	Assistant in Surgery
★Oliver A. James	Assistant in Surgery
Robert D. Duncan	Assistant in Surgery
★John F. Schaefer	Assistant in Surgery
★Howard F. Kinnamon, Jr.	Assistant in Surgery

Instruction is given by means of lectures, laboratory work, recitations, dispensary work, bedside instruction, ward classes, and clinics. The work begins in the second year, and continues throughout the third and fourth years.

The teaching is done in the anatomical laboratory, operative surgery laboratory, the dispensaries, wards, clinical laboratories and operating rooms of the University and Mercy Hospitals, and in the wards and operating rooms of the Baltimore City Hospitals.

SECOND YEAR

Topographic and Surgical Anatomy. The course is designed to bridge the gap between anatomy in the abstract and clinical anatomy as applied to the study and practice of medicine and surgery.

The teaching is done in the anatomical laboratory, and students are required to demonstrate all points, outlines, and regions on the cadaver. Underlying regions are dissected to bring out outlines and relations of structures.

Two lectures and two laboratory periods per week during the second semester. Drs. Brantigan, Adams, Covington, Settle, Walker and Duncan.

Total hours: 96.

Principles of Surgery. This course includes history-taking, records of physical examinations, and of operations and progress notes; the preparation of surgical dressings, suture materials and solutions. It includes inflammation, infections, ulcers, gangrene, fistulae and sinuses, hemorrhage, shock and tumors.

Lectures and conferences, two hours per week for one semester, are given to the whole class. Dr. Aycock.

THIRD YEAR

General and Regional Surgery. Lectures, recitations and clinics on the principles of surgery and general surgery are given three hours a week to the whole class. Dr. C. R. Edwards.

The class is divided into groups and receives instruction in history-taking, gross pathology, and surgical diagnosis—at the bedside and in the dead-house of the Baltimore City Hospitals. Drs. Aycock, C. A. Reifschneider, Toulson, Brantigan and Adams.

Operative Surgery. Two courses are given in operative surgery under the supervision of Dr. Peake assisted by Drs. Chenowith, Deckert, Govatos, Healy, Karns, W. R. Johnson and Hyman. The class is divided into sections and each section is given practical and individual work under the supervision of the instructors.

Fractures and Dislocations. This course consists of instruction in the various forms of fractures, dislocations and their treatment. There is a regular schedule of didactic lectures, which is supplemented by practical demonstrations in diagnosis and treatment.

Surgical Dispensary. Under supervision, the student takes the history, makes the physical examinations, attempts the diagnosis, and, as far as possible, carries out the treatment of the ambulatory surgical patients in the University and in the Mercy Hospitals. Mercy Hospital—Dr. Helfrich assisted by the whole dispensary staff. University Hospital—Drs. Little and Settle assisted by the whole dispensary staff.

FOURTH YEAR

Clinics. A weekly clinic is given at the Mercy and at the University Hospitals to one-half the class throughout the year. As far as possible this is a diagnostic clinic. Mercy Hospital—Dr. Hutchins. University Hospital—Dr. Shipley.

Surgical Pathology A weekly exercise of one hour at Mercy Hospital for one semester at which specimens from the operating room and museum are studied in the gross and microscopically in relation to the case history. Dr. Bongardt.

Traumatic Surgery. This course deals with operative and post-operative treatment of accident cases, with instructions as to the relationship between the state, the employee, the employer, and the physician's duty to each. One hour a week to sections of the class throughout the year. Dr. Edmunds.

Clinical Clerkship. This work includes the personal study of assigned hospital patients, under supervision of the staffs of the University and Mercy Hospitals, history-taking, and physical examination of patients, laboratory examinations, attendance at operations and observation of post-operative treatment.

Ward Classes. Ward-class instruction in small groups will consist of ward rounds, surgical diagnosis, treatment and the after-care of operative cases. Mercy Hospital—Drs. Hutchins, Blake, Bongardt, Nelson, Marvel and Maxson. University Hospital—Drs. Shipley, Edmunds, Charles Reid Edwards and Aycock.

ANAESTHESIA

E. Hollister Davis	Assistant in Anaesthesia
Mary J. O'Brien	Anaesthetist
Ruth Elliott	Anaesthetist
Rose Furlong	Anaesthetist

THIRD YEAR

Lectures are given on the general physiology of anaesthesia, with consideration of special physiology of each anaesthetic agent; methods of induction and administration of anaesthesia; factors influencing the selection of the anaesthetic and types of anaesthetic agents; and the preparation and care of the anaesthetized patient.

The lectures are correlated with practical demonstrations during operative clinics at the City Hospitals.

FOURTH YEAR

During operative clinics in both surgery and gynecology each student will be given practical instruction in the administration of anaesthetics and will be required to record such changes as take place in blood pressure, pulse and respiration.

DERMATOLOGY

Harry M. Robinson, Sr	Professor of Dermatology
Francis A. Ellis	Assistant Professor of Dermatology
John R. Abercrombie	Associate in Dermatology
★Harry M. Robinson, Jr.	Associate in Dermatology
★Lester N. Kolman	Instructor in Dermatology
Frederic A. Glass	Instructor in Dermatology
Rollin C. Hudson	Assistant in Dermatology
★Mark Hollander	Assistant in Dermatology
★Benjamin Highstein	Assistant in Dermatology
Solomon Tanenbaum	Assistant in Dermatology

A weekly clinic is given at University and Mercy Hospitals throughout the year. This course consists of demonstrations of the common diseases of the skin, and conferences, in addition to a number of lectures on the general principles of dermatology. Drs. Robinson and Ellis.

Dispensary instruction is given in the diagnosis and treatment of skin diseases at the University Hospital by Dr. Robinson and dispensary staff, and at Mercy Hospital by Dr. Ellis and dispensary staff.

Third year	15 hours
Fourth Year	49 hours
Total	64 hours

ORTHOPAEDIC SURGERY

Allen Fiske Voshell	Professor of Orthopaedic Surgery
Albertus Cotton	Professor of Orthopaedic Surgery

Compton Riely	Clinical Professor of Orthopaedic Surgery
Moses Gellman	Associate Professor of Orthopaedic Surgery
Harry L. Rogers	Associate Professor of Orthopaedic Surgery
★Henry F. Ullrich	Assistant Professor of Orthopaedic Surgery
I. H. Maseritz	Instructor in Orthopaedic Surgery
John V. Hopkins	Assistant in Orthopaedic Surgery
Jason H. Gaskell	Assistant in Orthopaedic Surgery
★William B. Long, Jr	Assistant in Orthopaedic Surgery

Didactic, clinical, bedside and out-patient instruction is given to the fourth year at the University and Mercy Hospitals and Dispensaries, Kernan Hospital for Crippled Children at Dickeyville and Baltimore City Hospitals. Instruction is also given to the third year in small groups at the Baltimore City Hospitals.

Weekly lectures throughout the year present all phases of orthopaedic surgery except fractures; brief discussions and demonstrations of physical therapy are included.

Fourth year groups are given more intimate instruction biweekly at one of the above institutions; fracture cases are included here.

Third year	60 hours
Fourth year	90 hours
Total	150 hours

RHINOLOGY AND LARYNGOLOGY

Edward A. Looper	Professor of Rhinology and Laryngology
Waitman F. Zinn	Clinical Professor of Rhinology and Laryngology
Franklin B. Anderson	Associate Professor of Rhinology and Laryngology
W. Raymond McKenzie	Associate in Rhinology and Laryngology
Thomas R. O'Rourk	Associate in Rhinology and Laryngology
Cleo D. Stiles	Associate in Rhinology and Laryngology
Benjamin S. Rich	Associate in Rhinology and Laryngology
F. A. Kayser	Assistant in Rhinology and Laryngology
★Theodore A. Schwartz	Assistant in Rhinology and Laryngology
★William C. Humphries	Assistant in Rhinology and Laryngology
Frederick T. Kyper	Assistant in Rhinology and Laryngology
Samuel L. Fox	Assistant in Rhinology and Laryngology

Third Year. Instruction to whole class is given in the common diseases of the nose and throat, attention being especially directed to infections of the accessory sinuses, the importance of focal infections in the etiology of general diseases and modern methods of diagnosis. Lectures illustrated by lantern slides are given one hour weekly for seven weeks by Dr. Looper.

Fourth Year. Dispensary instruction is given for one and one-half hours daily, to small sections at the University and the Mercy Hospitals. The student is afforded an opportunity to study, diagnose and treat patients under supervision. Ward classes and clinical demonstrations are given in periods of one and one-half hours weekly throughout the session in the University and the Mercy Hospitals.

The Looper Clinic for bronchoscopy and esophagoscopy, recently established in the University Hospital, affords unusual opportunities for students to study diseases of the larynx, bronchi and esophagus. The clinic is open to students daily from 2 to 4 P.M., under direction of Dr. Looper.

The Mercy Hospital clinic for bronchoscopy and esophagoscopy is under the direction of Dr. Zinn. In these two clinics the etiology, symptomatology, diagnosis and treatment of foreign bodies in the air and food passages, as well as bronchoscopy, are taught to students, as an aid in the diagnosis and treatment of diseases of the lungs.

Third year	9 hours
Fourth year	53 hours
Total	62 hours

GENITO-URINARY SURGERY

W. H. Toulson	Professor of Genito-Urinary Surgery
Kenneth D. Legge	Clinical Professor of Genito-Urinary Surgery
Austin H. Wood	Associate in Genito-Urinary Surgery
L. J. Millan	Associate in Genito-Urinary Surgery
L. K. Fargo	Associate in Genito-Urinary Surgery
John F. Hogan	Associate in Genito-Urinary Surgery
W. A. H. Councill	Associate in Genito-Urinary Surgery
★Harry S. Shelley	Associate in Genito-Urinary Surgery
Francis W. Gillis	Associate in Genito-Urinary Surgery
★Samuel T. Helms	Instructor in Genito-Urinary Surgery
★Howard B. Mays	Instructor in Genito-Urinary Surgery
★Hugh Jewett	Assistant in Genito-Urinary Surgery
Morris A. Fine	Assistant in Genito-Urinary Surgery

Third Year. This course is given for seven hours to the whole class. It consists of lectures and demonstrations, including the use of lantern slides and motion pictures. Dr. Toulson.

Fourth Year. The course in this year includes explanations and demonstrations of urethroscopy, cystoscopy, ureteral catheterization, renal function tests, urography, urine cultures and the various laboratory procedures. The teaching consists of clinics and ward rounds to small groups, and attendance by members of the senior class upon the out-patients in the dispensary. The student here is placed much on his own responsibility in arriving at a diagnosis. Members of the staff are in constant attendance for consultations. These dispensary classes are conducted at both the Mercy and University Hospitals where practically every variety of urogenital disease is seen and used for teaching purposes.

Third year	8 hours
Fourth year	64 hours
Total	72 hours

DISEASES OF THE RECTUM AND COLON

Charles F. Blake	Professor of Diseases of Rectum and Colon
J. Dawson Reeder	Professor of Diseases of Rectum and Colon
★Monte Edwards	Clinical Professor of Diseases of Rectum and Colon
Thurston R. Adams	Instructor in Diseases of the Rectum and Colon

Third Year. Seven lectures are given to the whole class. This course is for instruction in the diseases of the colon, sigmoid flexure, rectum and anus, and covers the essential features of the anatomy and physiology of the large intestine as well as the various diseases to which it is subject. Dr. Reeder and Dr. Edwards.

Fourth Year. Ward and dispensary instruction is given in the University and Mercy Hospitals, where different phases of the various diseases are taught by direct observation and examination. The use of the proctoscope and sigmoidoscope in the examination of the rectum and sigmoid is made familiar to each student. Mercy Hospital—Dr. Blake. University Hospital—Drs. Reeder and Adams.

Third year	7 hours
Fourth year	16 hours
Total	23 hours

OTOLOGY

Thomas R. O'Rourk	Clinical Professor of Otology
Franklin B. Anderson	Associate Professor of Otology
Benjamin S. Rich	Associate in Otology
★William D. Parr	Assistant in Otology
Cleo D. Stiles	Assistant in Otology
Richard S. Owens	Assistant in Otology

The course in otology is planned to give a practical knowledge of the anatomy and physiology of the ear, and its proximity and relationship to the brain and other vital structures. The inflammatory diseases, their etiology, diagnosis, treatment and complications are particularly stressed, with emphasis upon their relationship to the diseases of children, head-surgery and neurology.

Third Year. The whole class is given instruction by means of talks, anatomical specimens and lantern slides.

Fourth Year. Small sections of the class receive instruction and make personal examinations of patients under the direction of an instructor. The student is urged to make a routine examination of the ear in his ward work in general medicine and surgery.

Third year	12 hours
Fourth year	40 hours
Total	52 hours

NEUROLOGICAL SURGERY

Charles Bagley, Jr.	Professor of Neurological Surgery
Richard G. Coblentz	Associate Professor of Neurological Surgery
James G. Arnold, Jr., M.D.	Instructor in Neurological Surgery
★William W. McKinney	Assistant in Neurological Surgery

Third Year. The course covers instruction in diagnosis and treatment of surgical conditions of the brain, spinal cord and the peripheral nerves. Dr. Bagley.

Fourth Year. Weekly ward rounds and conferences are given at the University Hospital. Drs. Bagley and Coblentz.

Third year	12 hours
Fourth year	30 hours
Total	42 hours

ONCOLOGY

J. Mason Hundley, Jr.	Professor of Gynecology
Grant E. Ward	Associate Professor of Surgery
Beverley C. Compton	Associate in Gynecology
John C. Dumler	Associate in Gynecology
★Murray M. Copeland	Instructor in Surgery
E. Eugene Covington	Instructor in Surgery
J. Duer Moores	Instructor in Surgery
★Ernest I. Cornbrooks, Jr.	Instructor in Gynecology
★Arthur G. Siwinski	Instructor in Surgery
★Everett S. Diggs	Assistant in Gynecology
William K. Diehl	Assistant in Gynecology

Every facility for the diagnosis and treatment of neoplastic diseases is available; this includes electro-surgery, radium therapy and deep X-ray therapy.

An out-patient clinic is held twice weekly which affords an opportunity for instruction to a limited number of students. The gynecological problems are under the supervision of Dr. Hundley, and the general surgical conditions are under the direction of Dr. Ward.

Instruction, other than dispensary teaching, is given to small groups of students, for one hour a week, in the history, physics and practical application of radium. Drs. Ward and Hundley.

Third year	8 hours
Fourth year	16 hours
Total	24 hours

ORAL SURGERY

★Brice M. Dorsey	Professor of Oral Surgery
Charles A. Reifschneider	Associate Professor of Oral Surgery
Grant E. Ward	Associate Professor of Oral Surgery
William E. Hahn	Associate Professor of Oral Surgery
Vernon D. Kaufman	Associate Professor of Oral Surgery
J. Herbert Wilkerson	Assistant Professor of Oral Surgery
★Herbert E. Reifschneider	Instructor in Oral Surgery
Conrad L. Inman	Instructor in Oral Surgery
★B. Wallace Inman	Instructor in Oral Surgery
Dorsey R. Tipton	Instructor in Oral Surgery

This section in the Department of Surgery is established for the teaching of both medical and dental students. A new subdivision in the dispensary has also been established. Beds will be provided in the University Hospital for the care of patients who will be available for the teaching of students from both schools.

Senior year: clinics weekly.

Ward instruction and group teaching are given. This includes diagnosis and treatment of diseases of the face, mouth and jaws.

INDUSTRIAL MEDICINE AND SURGERY

Page Edmunds	Professor of Traumatic Surgery
G. Carroll Lockard	Professor of Clinical Medicine
Charles A. Reifschneider	Associate Professor of Traumatic Surgery and Oral Surgery
Thurston R. Adams	Instructor in Surgery

This section is under the combined supervision of the medical and surgical departments. It is a cooperative effort by members of the medical school and hospital staff to afford means for clinical and laboratory study of the patient who has been subjected to traumatic or medical industrial hazard, so that adequate care may be instituted to promote his physical well-being. The facilities of the laboratories of the medical school and hospital are available as required.

Under direction of this department limited undergraduate instruction is given, especially in the methods of examination and of keeping records; and in the general medico-legal principles as they affect the industrial employee, the employer, the general insurers, the physician and the hospital. There is also instruction on methods of making life insurance and other physical examinations, whether for employment or for health purposes. The wards of the University, Mercy and City Hospitals provide for bed-side instruction.

Total hours: 48.

FIRST AID INSTRUCTION

This course was added to the curriculum in 1942. Instruction consists of lectures combined with practical demonstrations and actual practice by students for two (2) hours every week for ten (10) weeks during the second semester of the Freshman Year.

PLASTIC SURGERY

Edward A. Kitlowski	Associate in Plastic Surgery

This course is designed to acquaint students with the problems of reconstructive and plastic surgery. A subdivision in the dispensary has been established and beds for patients will be available for instruction in this course at the University and Baltimore City Hospitals and Kernan's Hospital for Crippled Children.

Third Year. Five lectures are given to the whole class. Dispensary instruction is provided on Tuesdays and Fridays.

Fourth Year. Ward rounds and operative demonstrations are held at the hospitals.

DEPARTMENT OF OBSTETRICS

L. H. Douglass	Professor of Obstetrics
J. McFarland Bergland	Associate Professor of Obstetrics
Emil Novak	Associate Professor of Obstetrics

J. G. M. Reese	Assistant Professor of Obstetrics
M. Alexander Novey	Assistant Professor of Obstetrics
Isadore A. Siegel	Assistant Professor of Obstetrics
★John E. Savage	Associate in Obstetrics
Margaret B. Ballard	Associate in Obstetrics
Dudley P. Bowe	Associate in Obstetrics
★Frank K. Morris	Instructor in Obstetrics
Hugh B. McNally	Instructor in Obstetrics
★Kenneth B. Boyd	Assistant in Obstetrics
W. Allen Deckert	Assistant in Obstetrics
★Jaroslav Hulla	Assistant in Obstetrics
Marius P. Johnson	Assistant in Obstetrics
Maxwell L. Mazer	Assistant in Obstetrics
★Joseph M. Blumberg	Assistant in Obstetrics
★Ferd. E. Kadan	Assistant in Obstetrics
J. Edward Norris	Assistant in Obstetrics
★Jacob R. Jensen	Assistant in Obstetrics
★J. Warren Albrittain	Assistant in Obstetrics
D. McClellen Dixon	Assistant in Obstetrics
★W. Kenneth Mansfield, Jr.	Assistant in Obstetrics
Bernard W. Donohue	Assistant in Obstetrics
George H. Davis	Assistant in Obstetrics
★Daniel I. Dann	Assistant in Obstetrics
Charles H. Doeller, Jr.	Assistant in Obstetrics
★J. King B. E. Seegar	Assistant in Obstetrics
D. Frank Kaltreider	Assistant in Obstetrics
Richard L. Goyne	Assistant in Obstetrics
★L. Calvin Gareis	Assistant in Obstetrics
Schuyler G. Kohn	Assistant in Obstetrics
Thos. E. Russell, Jr.	Assistant in Obstetrics

Third Year. The lectures and recitations consisting of three hours teaching weekly are designed to cover the anatomy of the female generative tract and the bony pelvis, the physiology and development of the ovum, and the physiology of pregnancy and labor. Following this the pathology of pregnancy, labor and the puerperium are taken up. Drs. Douglass, Novak, Reese, Novey and Siegel.

Each student spends time during his junior year at the Baltimore City Hospitals observing, assisting and finally delivering patients under strict supervision. Each student sees about twenty deliveries there, and does a considerable amount of the routine work.

The junior students are assigned as assistants to the seniors in the home delivery service and accompany them on deliveries.

Each student receives, in small groups, ten hours of instruction in palpation of patients and mensuration of the pelvis and demonstrations of the mechanism of labor. Drs. Siegel and McNally.

Fourth Year. At the weekly clinical conference, cases are presented and discussed and the student body is encouraged to offer opinions and to ask questions. There is no didactic teaching done, and an earnest effort is made to keep it, in every sense of the word, a conference. Dr. Douglass.

The ward classes are held twice weekly for five weeks for each group. Various subjects are assigned and discussed, patients and their histories are presented. Drs. Reese, Novey and McNally.

Manikin instruction is given once a week. Drs. Dixon, Doeller and Kaltreider.

During the same five-week period, the students are sent into patients' homes to conduct deliveries under supervision of a senior member of the house staff and with the assistance of a graduate nurse. The student is held responsible for the complete conduct of each assigned case.

Each student spends thirty hours in the prenatal clinic, taking histories and examining patients under supervision.

Finally, the students are invited to attend the monthly meetings of The Committee on Maternal Mortality, where all maternal deaths occurring in Baltimore are openly discussed.

Third year	148 hours
Fourth year	102 hours
Total	250 hours

DEPARTMENT OF GYNECOLOGY

J. Mason Hundley, Jr.	Professor of Gynecology
Thomas K. Galvin	Clinical Professor of Gynecology
Leo Brady	Assistant Professor of Gynecology
George A. Strauss, Jr.	Assistant Professor of Gynecology
Edward P. Smith	Assistant Professor of Gynecology
John T. Hibbitts	Associate in Gynecology
★Kenneth B. Boyd	Associate in Gynecology
John C. Dumler	Associate in Gynecology
Beverley C. Compton	Associate in Gynecology
Houston Everett	Associate in Gynecology
Thomas S. Bowyer	Instructor in Gynecology
Ernest S. Edlow	Instructor in Gynecology
W. Allen Deckert	Instructor in Gynecology
★Frank K. Morris	Instructor in Gynecology
★Ernest I. Cornbrooks, Jr.	Instructor in Gynecology
William B. Settle	Instructor in Gynecology
William K. Diehl	Instructor in Gynecology
★H. L. Granoff	Assistant in Gynecology
J. J. Erwin	Assistant in Gynecology
Helen I. Maginnis	Assistant in Gynecology
★Everett S. Diggs	Assistant in Gynecology
★Roland E. Bieren	Assistant in Gynecology
Edward G. Jones	Assistant in Gynecology

Third Year. A course of thirty lectures and recitations is given to the whole class. In addition, a short course of lecture-demonstrations is given at the Baltimore City Hospitals, consisting of eight periods of one hour each, in which small groups of students are instructed in the fundamentals of gynecological diagnosis and examination.

Fourth Year. Operative clinics—lectures and demonstrations—are given six hours per week, for five weeks, to sections of the class.

Instruction in female urology is given. A small number of students may attend the cystoscopic dispensary which is held twice weekly.

The course in gynecology also includes instruction in the diagnosis and treatment of cancer of the generative organs. Small groups of students attend the oncological dispensary for additional work.

Third year	38 hours
Fourth year	74 hours
Total	112 hours

DEPARTMENT OF OPHTHALMOLOGY

CLYDE A. CLAPP	Professor of Ophthalmology
M. RANDOLPH KAHN	Clinical Professor of Ophthalmology
H. K. FLECK	Clinical Professor of Ophthalmology
HENRY F. GRAFF	Assistant Professor in Ophthalmology
JONAS FRIEDENWALD	Lecturer inOphthalmic Pathology
JOSEPH I. KEMLER	Associate in Ophthalmology
F. EDWIN KNOWLES, JR	Associate in Ophthalmology
★F. A. HOLDEN	Instructor in Ophthalmology
MILTON C. LANG	Instructor in Ophthalmology
A. KREMEN	Instructor in Ophthalmology
THOMAS R. O'ROURK	Assistant in Ophthalmology
JEROME SNYDER	Assistant in Ophthalmology
★MARION H. GILLIS	Assistant in Ophthalmology

Third Year. Second semester. Dr. Kahn reviews the anatomy and physiology of the eye and discusses the methods used in making the various examinations. Errors of refraction and their effect upon the general system are explained. Weekly section work, demonstrating the use of the ophthalmoscope, is carried on during the entire session.

Fourth Year. Clinics and demonstrations are given in diseases of the eye, weekly, for one year. Dr. Clapp.

This course consists of lectures upon the diseases of the eye, with particular reference to their diagnosis and relation to general medicine. Special lectures will be given upon vascular changes in the eye and upon the pathology of the eye. Some operations will be demonstrated by motion pictures.

Weekly ward classes are held at the University, The Baltimore Eye, Ear and Throat and Mercy Hospitals during which the eye grounds in the various medical and surgical conditions are demonstrated. Also daily demonstrations are given in the taking of histories and the diagnosis and treatment of the various conditions as seen in the dispensary. Drs. Fleck, Kemler, Graff and Knowles.

Third year	20 hours
Fourth year	104 hours
Total	124 hours

DEPARTMENT OF ROENTGENOLOGY

Henry J. Walton	Professor of Roentgenology
★Walter L. Kilby	Acting Professor of Roentgenology
Albertus Cotton	Professor of Roentgenology
Charles N. Davidson	Associate in Roentgenology
★Charles W. Reavis	Assistant in Roentgenology

During the academic year small groups of the fourth year class are given weekly instruction in the diagnostic and therapeutic uses of the Roentgen rays. An effort is made to familiarize the student with the indications for and limitations of Roentgen ray examinations. The history, physics and practical application of Roentgen rays are alluded to but not stressed. Conferences are held with the various departments during the school year which are also open to members of the fourth year class.

Total hours: 96.

HISTORY OF MEDICINE*

★Louis A. M. Krause	Associate Professor of Medicine

Beginning with the spring of 1942 a group of lectures on the history of medicine has been presented on selected phases and trends of the development of medical knowledge and practice. It is planned to avoid duplication of subject matter for at least four years.

These lectures are offered primarily for our students, but a cordial invitation is extended to anyone who may wish to attend.

Announcement of the lectures will be made by mail and on the bulletin board of the School of Medicine.

ART AS APPLIED TO MEDICINE

★Carl Dame Clarke	Associate Professor of Art as Applied to Medicine

This department is maintained for the purpose of supplying pictorial and plastic illustrations for visual teaching in the classrooms of the medical school and for publication in scientific periodicals.

Special courses of instruction are given to qualified students during peacetime.

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* These lectures have been suspended during the emergency.

FIRST YEAR SCHEDULE

FIRST SEMESTER, APRIL 8 TO AUGUST 7, 1943

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	*Histology and Embryology 11–12 lecture *Bressler 2*		Gross Anatomy (9–1)	*Histology and Embryology 11–12 lecture *Bressler 2*		Gross Anatomy
12.00 to 1.00	Lunch			Lunch		
1.00 to 5.00	Gross Anatomy Lectures and Laboratories *Bressler 1*			Gross Anatomy Lectures and Laboratories *Bressler 1*		

* Course begins April 22.

SECOND SEMESTER, AUGUST 30 TO DECEMBER 23, 1943

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 12.00	Laboratory — Biological Chemistry *Sect. A*	Laboratory — Biological Chemistry *Sect. B*	Laboratory — Biological Chemistry *Sect. A*	Laboratory — Biological Chemistry *Sect. B*	10.30 to 11.30 Psychiatry *Adm. 1*	
12.00 to 12.50	Lunch	Lunch	Lunch	Lunch	Lunch	
12.50 to 1.50	Biological Chemistry *Adm. 1*	Biological Chemistry *Adm. 1*	Biological Chemistry *Adm. 1*	Biological Chemistry *Adm. 1*	Biological Chemistry *Adm. 1*	
2.00 to 5.00	*Neuro-anatomy *Bressler 2*	(Lecture, 2–3) Neuro-anatomy *Bressler 2*	Biological Chemistry Conference *Adm. 1*	(Lecture, 2–3) Neuro-anatomy *Bressler 2*	Biological Chemistry Conference *Adm. 1* (3.00–5.00) First aid (Sections will be posted) Sept. 3 to Nov. 5	

* Course begins September 27, 1943.

Locations of Lecture Halls and Laboratories:

Adm. 1—First Floor, Administration Building, Lombard and Greene Streets.
A. H.—Anatomical Hall—Upper Hall, N. E. Cor. Lombard and Greene Streets.
C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.
Biological Chemistry Laboratory—Third Floor, 31 South Greene Street.
Bressler Research Laboratory—29 S. Greene Street.
  Gross Anatomy—First Floor
  Histology and Embryology—Second Floor.
  Neuro-anatomy—Second Floor.

SECOND YEAR SCHEDULE

FIRST SEMESTER, APRIL 8 TO AUGUST 7, 1943

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 9.30	Physiology *Bressler 2*	Physiology *Bressler 2*	Medicine *Bressler 2*	Physiology *Bressler 2*	Physiology *Bressler 2*	
9.30 to 10.30	Physiology Conference *Bressler 2*	Bacteriology *Adm. 1*	Physiology *Bressler 2*	Pharmacology *Bressler 2*	Pharmacology *Bressler 2*	
10.30 to 12.30	†Bacteriology Laboratory				Psychiatry *C. H.* Neurological Diagnosis *C. H.*	
12.30	Lunch					
1.00 to 5.00	Pharm. Lect. (1–2) *Bressler 2* Pharmacology *B* Physiology *A*	Laboratory *A* Laboratory *B*	Elective	Pharmacology (1 to 4) *B* Physiology *A*	Laboratory *A* Laboratory *B*	

† Bacteriology Laboratory—Section work during the last month.

SECOND SEMESTER, AUGUST 30 TO DECEMBER 23, 1943

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.30	Surgery *Bressler 2*	Surgery *Bressler 2*	Surgical Anatomy *Bressler 2*		Physical Diagnosis *Bressler 2* 4 lectures	
9.30 to 10.30	Pharmacology *Bressler 2*	Pharmacology *Bressler 2*	Surgical Anatomy Laboratory *Bressler 1*	9–10 Medical Clinic *Amp.*	Pharmacology *Bressler 2*	
10.30 to 11.30	Pathology *C. H.*	Pathology *C. H.*		Pathology *C. H.*	Pathology *C. H.*	
11.30	Lunch					
12.00 to 2.00	Pathology Laboratory	Pathology Laboratory	Immunology Laboratory	Pathology Laboratory	Pathology Laboratory	
2.00 to 3.00	Surgical Anatomy *Bressler 2*	‖Immunology Laboratory		Pharmacology Laboratory *Sect. A*	Pharmacology Laboratory *Sect. B*	
3.00 to 5.00	Surgical Anatomy Laboratory *Bressler 1*		Optional period Pathology Immunology	Physical Diagnosis *Sect. B* (3.00–5.00) *U. H. D.*	Physical Diagnosis *Sect. A* (3.00–5.00) *U. H. D.*	

‖ Immunology Laboratory—Section work during last two months.

Locations of Lecture Halls and Laboratories:

Adm. 1—First floor, Administration Building, Lombard and Greene Streets.
C. H.—Chemical Hall, Lower Hall, Lombard and Greene Streets.
Amp.—Wilson Memorial Amphitheatre, New University Hospital, Greene and Redwood Streets, Eighth Floor
U. H. D —University Hospital Dispensary, Old Hospital Building.

Laboratories:

Physiology, Pharmacology, Surgical Anatomy—Bressler Building.
Bacteriology, Immunology, Pathology, Second Floor, 31 S. Greene Street.

THIRD YEAR SCHEDULE
APRIL 8 TO DECEMBER 23, 1943

SCHEDULE 1

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	(Whole Class) Obstetrics *C. H.* †Gynecology Nov. 8 to 29	(Whole Class) Surgery *C. H.*	(Whole Class) Obstetrics *C. H.* †Gynecology Nov. 10 to Dec. 1	(Whole Class) Surgery *C. H.*	(Whole Class) Pathology *C. H.*	(Whole Class) Surgery *C. H.* †Gynecology Sept. 4 to ‡Oct. 23
9.20 to 10.00	Transfer to Baltimore City Hospitals					
10.00 to 12.00	Physical Diagnosis, Pathology, Neurology and Pediatrics at B. C. H					
12.00 to 1.00	Transfer and Lunch	Transfer and Lunch	Lunch	Transfer and Lunch	Lunch	
1.00 to 2.00	(Whole Class) Proctology, Otology, Urology, Nose & Throat, Plastic Surgery *C. H.*	(Whole Class) •Gynecology †Eye—9 wks. (Aug. 31 to Oct. 26) †Oncology —5 wks. (Nov. 2 to Nov. 30) *C. H.*	Medical Clinic *B. C. H.*	(Whole Class) Clinical Pathology *Bressler 2*	Obstetrical Clinic *B. C. H.*	
2.00 to 4.00	(Whole Class) Pathology Laboratory *31*		Surgery (2.00 to 4.00) — Pediatrics (2.00 to 4.30) — Gynecology Orthopaedics Psychiatry (Subgroups of Surgery Group) (4.00 to 5.00)	(Whole Class) Clinical Pathology — Laboratory *Bressler 5*	Surgery (2.00 to 4.00) — Pediatrics (2.00 to 4.30) — Gynecology Orthopaedics Psychiatry (Subgroups of Surgery Group) (4.00 to 5.00)	
4.00 to 5.00	(Whole Class) Hygiene and Public Health *C. H.*	(Whole Class) Physical Diagnosis, Psychiatry, Legal Medicine *C. H.*				

• First Semester. † Second Semester. ‡No classes after Oct. 23.

THIRD YEAR SCHEDULE

APRIL 8 TO DECEMBER 23, 1943

SCHEDULE 2

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8.30 to 9.20	Same as Schedule 1					
9.20 to 10.20	Pediatrics *C. H.*	Medicine *C. H.*	Medicine *C. H.*	Therapeutics *C. H.*	Medicine *C. H.*	Neurology *C. H.*
10.30 to 12.30	Operative Surgery—*Bressler 6* Medical and Surgical Dispensaries—(Univ. and Mercy Sections)					
12.30 to 1.00	Lunch					
1.00 to 2.00	Same as Schedule 1		Medical Clinic *Amp.*	Same as Schedule 1	Psychiatry (9 weeks) Dermatology (6 weeks) N.B.—The whole section reports to psychiatry for first three weeks, then subdivides. *C. H.* for first 3 wks. U. H. Disp. Last 12 wks.	
2.00 to 4.00			Ophthalmoscopy (5 weeks) *B. E. H.* — Obstetrics (5 weeks) Univ. Hosp. Disp. — Otology (5 wks.) *Bressler 5* *Conf. Room*			
4.00 to 5.00					Obstetrics *Br. 2*	

The Junior Class will be divided into two sections—A and B. Each section reports to classes in keeping with the following schedule assignment, in which the letters represent the class sections and the numerals indicate the schedules to be followed for the 15-week periods shown.

Schedule Assignment

Periods	*Sections and Schedules*
April 8 to July 24, 1943	A-1, B-2
August 30 to December 4, 1943	B-1, A-2

Locations of Lecture Halls, etc.

A. H.—Anatomical Hall, Upper Hall, N. E. Cor. Lombard and Greene Streets.
Amp.—Wilson Memorial Amphitheatre, New University Hospital, Eighth Floor.
B. C. H.—Baltimore City Hosps., 4940 Eastern Ave.
B. E. H.—Baltimore Eye, Ear and Throat Hospital, 1214 Eutaw Place.
Bressler—Bressler Building, 29 S. Greene Street.
C. H.—Chemical Hall, Lower Hall, N. E. Cor. Lombard and Greene Streets.
Univ. Hosp.—New University Hospital, Greene and Redwood Streets.
U. H. Disp.—Old Hospital Building, S. W. Cor. Lombard and Greene Streets.
31—31 South Greene Street.
Clinical Pathology Laboratory—Fifth Floor, Bressler Building.
Pathology Laboratory—31 South Greene Street, Special Rooms, Basement.

Mid-Year Examinations—July 26-31, 1943
Final Examinations—December 6-18, 1943

FOURTH YEAR SCHEDULE
APRIL 8 TO DECEMBER 23, 1943

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9.00 to 11.00	Ward Classes — (a) Medicine (a) Surgery (b) Obstetrics (d) Pediatrics	Ward Classes — (a) Medicine (a) Surgery (b) Gynecology (c) Gynecology	Ward Classes — (a) Medicine (a) Surgery (b) Obstetrics (d) Pediatrics	Ward Classes — (a) Medicine (a) Surgery (b) Gynecology (c) Gynecology	Ward Classes — (a) Medicine (a) Surgery (b) Obstetrics (d) Pediatrics	Ward Classes — (a) Medicine (a) Surgery (b) Gynecology (d) Pediatrics
11.00 to 12.00	Orthopaedic Surgery *Univ. Sec. Amp.* *P. & S. Sec. 51*	Medical Clinic *Univ. Sec. Amp.* Surgical Pathology *P. & S. Sec. 40*	Clinical Pathological Conference *Univ. Sec. Amp.* *P. & S. Sec. 34*	Surgical Clinic *Univ. Sec. Amp.* *P. & S. Sec. 51*	Medical Clinic *Univ. Sec. Amp.* *P. & S. Sec. 34*	Pediatric Clinic *Univ. Sec. Amp.* *P. & S. Sec. 34*
12.00 to 2.00	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary, Lunch	Dispensary
2.15 to .15	Dermatology Clinic 1st time Full Class *Amp.* then divide *Univ. Sec.* { *Disp.* *Amp.* *P. & S. Sec. 34*	Neurology Clinic *Univ. Sec. Amp.* *P. & S. Sec. 34*	Eye and Ear Clinic (Full Class at Univ. Hosp.) *Amp.*	Obstetrical Clinic (Full Class at Univ. Hosp.) *Amp.*	Hygiene and Public Health Apr. 9 to May 21 Tropical Medicine May 28 (Full Class at Univ. Hosp.) *Amp.*	
3.30 to 5.00	*P. & S. Sect.* and *Univ. Sect.* Ward Classes	*P. & S. Sect.* Ward Classes	*P. & S. Sect.* Ward Classes	*P. & S. Sect.* Ward Classes	*P. & S. Sect.* Ward Classes	
		Medicine		Medicine	Neurology	Medical Section
		Orthopaedics	Nose and Throat	Proctology	Roentgenology	Surgical "
		Pediatrics		Pediatrics	Psychiatry *Amp.*	Special "
3.30 to 5.00	See special schedule Medical School bulletin board	*Univ. Sect.* Ward Classes	*Univ. Sect.* Ward Classes	*Univ. Sect.* Ward Classes	*Univ. Sect.* Ward Classes	
		Medicine		Therapeutics	Neurology	Medical Section
		Proctology	Urology *Amp.*	Nose and Throat	Orthopaedic Surgery (*Kernan Hospital*)	Surgical "
		Oncology (3.30-4.30) *Amp.*	Eye and Ear		Psychiatry *Amp.*	Special "

(a)—Univ. and P. & S. Sections.
(b)—Univ. Section.
(c)—Whole P. & S. special group.
(d)—P. & S. special group, divided attendance at Univ. and P. & S.

The Senior Class is divided into two sections, which report, one at Lombard and Greene Streets, the other at Calvert and Saratoga Streets for one semester each, then rotate.

Each section of the class is divided into three groups—Medical, Surgical, and Special. These groups will rotate on the following dates:

First Semester		*Second Semester*	
1st period	Apr. 8–May 13	1st period	Aug. 30–Sept. 30
2nd period	May 14–June 17	2nd period	Oct. 1–Nov. 1
3rd period	June 18–July 24	3rd period	Nov. 2–Dec. 4

C. H.—Chemical Hall—N. E. Cor. Lombard and Greene Streets.
Amp.—Wilson Memorial Amphitheatre—New University Hospital.
Disp. Amp.—Old Hospital Building, fourth floor S. W. cor. Lombard and Greene Streets.
P. & S., 34—Second floor, Calvert and Saratoga Streets.
P. & S., 40, 51—Fourth floor, Calvert and Saratoga Streets.

Univ. Section Dispensary schedule posted in Old Hospital Bldg.
P. & S. Secton—obtain special schedule at Mercy Hospital

UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE AND COLLEGE OF PHYSICIANS AND SURGEONS

GRADUATES, MARCH 23, 1943

Adam, Alberto Lotfalla...Puerto Rico
Aderholdt, Marcus Lafayette, Jr., A.B. North Carolina
Allsopp, Richard Charles...Pennsylvania
Almodóvar, Ramón Ignacio..Puerto Rico
Baker, Emory Forester, A.B...Washington
Barnes, John David, A.B...Massachusetts
Berry, Robert Zinn, A.B., B.S. West Virginia
Bizzell, James Wooten, B.S. North Carolina
Bowen, Charles Vernon, Jr., B.S. Maryland
Brennan, Thomas Joseph, B.S...Maryland
Brinton, Sherman Simons, A.B......Utah
Brooks, Ralph King, A.B...West Virginia
Brooks, Ross Chilton, B.S.....Maryland
Bryson, William James, A.B....Maryland
Chenowith, Ralph Stallings....Maryland
Cohen, Harry, B.S............Maryland
Coughlin, John Benedict, B.S. Pennsylvania
Courtney, Donald Lawrence.....Oregon
Crastnopol, Philip, B.S.....New Jersey
Cusani, Benedict Albert, B.S.....Florida
Dalmáu, Miguel Sebastian, B.S. Puerto Rico
Davis, William Joseph Graham, A.B. District of Columbia
Diorio, John Daniel, Jr., B.S...Connecticut
Dunne, Thomas Benjamin, A.B. New York
Eaton, William Robert, A.B....Maryland
Epperson, John Wallace Walker, B.S. Maryland
Fowler, Richard Lowman, B.S. North Carolina
French, Samuel Lawson, A.B...Maryland
Friedman, Paul Norman, A.B...Maryland
Garrison, Alfred Selman, A.B...Maryland
Giglia, Tony Robert, Jr., A.B. West Virginia
Goldberg, Raymond Bernard, A.B. Maryland
Grave de Peralta, José Ignacio, B.S. Cuba
Gray, David Benoni, B.S...West Virginia
Hagan, William Baker, B.S....Maryland
Hassler, Frank Stanley, III, A.B. Pennsylvania
Honigman, Alvin Herbert, B.S...Maryland
Hunt, William Jack, B.S...North Carolina
Jenkins, William Romulus, B.S. North Carolina
Keadle, Robert Franklin, B.S...Maryland
LaMar, Robert Charles, Jr.....Maryland
Lee, Ferdinand Wayne, A.B. West Virginia
Lewis, Richard Quarles, A.B...Maryland
Livingstone, Robert Charles, A.B. West Virginia
Lukats, Paul George..............Ohio
MacDonald, Charles Renwick, B.S. Maryland
Matchar, Joseph Charles, A.B...Maryland
McMillan, Marcy Emory, Jr. West Virginia
Mele, Vincent James, Jr., B.S...New Jersey
Méndez, Néstor Herman, B.S. Puerto Rico
Miller, James Delmar, A.B.........Ohio
Minervini, Robert Virginius, A.B. New York
Morris, John David, A.B...West Virginia
Musnick, Henry, A.B.........Maryland
Myers, Joseph Carl, A.B.......Maryland
Nash, Kenneth Powell......California
Neff, Charles Amos, A.B........Illinois
Parés, Maria Amalia, B.S....Puerto Rico
Parrott, Frank Strong, B.S. North Carolina
Pérez, Enrique, A.B.........Puerto Rico
Perry, Henry Baker, Jr.,..North Carolina
Peterson, Preston Horsley........Utah
Queen, Joseph Emmett, A.B....Maryland
Rangle, Raymond Veto, B.S....Maryland
Renshaw, Josephine Elizabeth, B.S. Maryland
Richards, Granville Hampton, A.B. Maryland
Robbins, Martin Albert, A.B...Maryland
Rosenstein, Louis Nathan, B.S...Maryland
Royer, Earl Linwood..........Maryland
Rude, Richard Sprogoe.....New Jersey
Sacks, Seymour, A.B...........Maryland
Samuels, Irving Leonard, A.B...Maryland
Sharp, Nathaniel.............Maryland
Sigler, John Wiltshire, A.B.........Ohio
Soler-Favale, Marta Emilia, B.S. Puerto Rico
Spier, Andrew Allan, A.B......Maryland
Stafford, Harold Rellinger.....Michigan
Stewart, Edwin Harvey, Jr.....Maryland
Stier, Howard William, A.B...New Jersey
Stoner, James Ernest, Jr., A.B...Maryland
Taylor, Irving Julian, A.B.....Maryland
Torres, José Manuel, B.S.....Puerto Rico
Trader, Charles Weldon, A.B...Maryland
Tunney, Robert Boone, B.S....Maryland
Van Lill, Stephen Joseph, III, A.B. Maryland

Varhol, Joseph Gregory, Jr., B.S. New Jersey
Wachsman, Irvin Louis........Maryland
Walker, Samuel Haywood, B.S. North Carolina
Warren, Frank Orville, Jr...New Hampshire
Webster, Thomas Clyde.......Maryland
Weiss, Maurice Richard....Pennsylvania
Wich, Joseph Carlton........Maryland
Williamson, Oliver Wayne, B.S. North Carolina
Wilson, Thomas Leslie........Maryland
Wise, Robert Edward....Pennsylvania
Wooddy, Arthur Overton......Maryland
Worgan, David Kuykendall, B.S. Maryland
Yurko, Leonard Emory, A.B. West Virginia

HONORS

University Prize Gold Medal

Paul Norman Friedman

Certificates of Honor

Philip Crastnopol
Kenneth Powell Nash
Martin Albert Robbins
Louis Nathan Rosenstein
David Kuykendall Worgan

The Dr. A. Bradley Gaither Memorial Prize for the best work in genito-urinary surgery during the senior year..........................David Kuykendall Worgan

INTERNSHIPS—GRADUATES OF MARCH 23, 1943

Effective April 1, 1943

Adam, Alberto Lotfalla.............West Baltimore General Hospital, Baltimore, Md.
Aderholdt, Marcus Lafayette, Jr.......................Mercy Hospital, Baltimore, Md.
Allsopp, Richard Charles....................University of Pittsburgh Medical Center, Pittsburgh, Pa.
Almodóvar, Ramón Ignacio................Baltimore City Hospitals, Baltimore, Md.
Baker, Emory Forester..........................St. Luke's Hospital, Chicago, Ill.
Barnes, John David..............................U. S. Naval Hospital, Newport, R. I.
Berry, Robert Zinn.................................Mercy Hospital, Baltimore, Md.
Bizzell, James Wooten..........................University Hospital, Baltimore, Md.
Bowen, Charles Vernon, Jr...................Delaware Hospital, Wilmington, Del.
Brennan, Thomas Joseph...........................Mercy Hospital, Baltimore, Md.
Brinton, Sherman Simons...............Dr. W. H. Groves Latter-Day Saints Hospital, Salt Lake City, Utah
Brooks, Ralph King...................United States Naval Hospital, Portsmouth, Va.
Brooks, Ross Chilton.............................Mercy Hospital, Baltimore, Md.
Bryson, William James...........................St. Agnes' Hospital, Baltimore, Md.
Chenowith, Ralph Stallings.....................University Hospital, Baltimore, Md.
Cohen, Harry..University Hospital, Baltimore, Md.
Coughlin, John Benedict.......................Robert Packer Hospital, Sayre, Pa.
Courtney, Donald Lawrence.........................Emanuel Hospital, Portland, Ore.
Crastnopol, Philip...........................Kings County Hospital, Brooklyn, N. Y.
Cusani, Benedict Albert.............James M. Jackson Memorial Hospital, Miami, Fla.
Dalmáu, Miguel Sebastian................Presbyterian Hospital, San Juan, P. R.
Davis, William Joseph Graham..............Johns Hopkins Hospital, Baltimore, Md.
Diorio, John Daniel, Jr..........................St. Mary's Hospital, Waterbury, Conn.

Dunne, Thomas Benjamin..................University Hospital, Baltimore, Md.
Eaton, William Robert..............Allegheny General Hospital, Pittsburgh, Pa.
Epperson, John Wallace Walker..............University Hospital, Baltimore, Md.
Fowler, Richard Lowman...............Yonkers General Hospital, Yonkers, N. Y.
French, Samuel Lawson.....................University Hospital, Baltimore, Md.
Friedman, Paul Norman...............Baltimore City Hospitals, Baltimore, Md.
Garrison, Alfred Selman.....................St. Agnes' Hospital, Baltimore, Md.
Giglia, Tony Robert, Jr..........................Mercy Hospital, Baltimore, Md.
Goldberg, Raymond Bernard.........................Sinai Hospital, Baltimore, Md.
Grave de Peralta, José Ignacio....West Baltimore General Hospital, Baltimore, Md.
Gray, David Benoni..............................Mercy Hospital, Baltimore, Md.
Hagan, William Baker.......................University Hospital, Baltimore, Md.
Hassler, Frank Stanley, III...................Delaware Hospital, Wilmington, Del.
Honigman, Alvin Herbert......................University Hospital, Baltimore, Md.
Hunt, William Jack...........................University Hospital, Baltimore, Md.
Jenkins, William Romulus.....................University Hospital, Baltimore, Md.
Keadle, Robert Franklin......................University Hospital, Baltimore, Md.
LaMar, Robert Charles, Jr...........United States Marine Hospital, Baltimore, Md.
Lee, Ferdinand Wayne............................Mercy Hospital, Baltimore, Md.
Lewis, Richard Quarles..................United States Naval Hospital, Brooklyn, N. Y.
Livingstone, Robert Charles.........Medical College of Virginia, Hospital Division, Richmond, Va.
Lukats, Paul George..............South Baltimore General Hospital, Baltimore, Md.
MacDonald, Charles Renwick......South Baltimore General Hospital, Baltimore, Md.
Matchar, Joseph Charles.................Kings County Hospital, Brooklyn, N. Y.
McMillan, Marcy Emory, Jr......................University Hospital, Baltimore, Md.
Mele, Vincent James, Jr.....................St. Michael's Hospital, Newark, N. J.
Méndez, Néstor Hernan.....................Presbyterian Hospital, San Juan, P. R.
Miller, James Delmar........................Youngstown Hospital, Youngstown, Ohio
Minervini, Robert Virginius................Yonkers General Hospital, Yonkers, N. Y.
Morris, John David.........................Johns Hopkins Hospital, Baltimore, Md.
Musnick, Henry...................................Sinai Hospital, Baltimore, Md.
Myers, Joseph Carl...............................Mercy Hospital, Baltimore,Md.
Nash, Kenneth Powell........................Collis P. and Howard Huntington Memorial Hospital, Pasadena, Calif.
Neff, Charles Amos................United States Marine Hospital, Baltimore, Md.
Parés, Maria Amalia.............Hospital For Women of Maryland, Baltimore, Md.
Parrott, Frank Strong........................University Hospital, Baltimore, Md.
Pérez, Enrique...................Fajardo Charity District Hospital, Fajardo, P. R.
Perry, Henry Baker, Jr...................Baltimore City Hospitals, Baltimore, Md.
Peterson, Preston Horsley . . Salt Lake County General Hospital, Salt Lake City, Utah
Queen, Joseph Emmett............................Mercy Hospital, Baltimore, Md.
Rangle, Raymond Veto.......................University Hospital, Baltimore, Md.
Renshaw, Josephine Elizabeth.................University Hospital, Baltimore, Md.
Richards, Granville Hampton.................University Hospital, Baltimore, Md.
Robbins, Martin Albert....................Michael Reese Hospital, Chicago, Ill.
Rosenstein, Louis Nathan.................Kings County Hospital, Brooklyn, N. Y.
Royer, Earl Linwood.......................Bon Secours Hospital, Baltimore, Md.
Rude, Richard Sprogoe.....................Bon Secours Hospital, Baltimore, Md.
Sacks, Seymour..........Metropolitan Hospital, Welfare Island, New York, N. Y.
Samuels, Irving Leonard..................Kings County Hospital, Brooklyn, N. Y.

Sharp, Nathaniel	United States Naval Hospital, Portsmouth, Va.
Sigler, John Wiltshire	Henry Ford Hospital, Detroit, Mich.
Soler-Favale, Marta Emilia	St. Mary's Hospital, Waterbury, Conn.
Spier, Andrew Allan	Pittsburgh Medical Center, Pittsburgh, Pa.
Stafford, Harold Rellinger	Providence Hospital, Detroit, Mich.
Stewart, Edwin Harvey, Jr.	University Hospital, Baltimore, Md.
Stier, Howard William	St. Agnes' Hospital, Baltimore, Md.
Stoner, James Ernest, Jr.	Garfield Memorial Hospital, Washington, D. C.
Taylor, Irving Julian	Baltimore City Hospitals, Baltimore, Md.
Torres, José Manuel	Bayamón Charity District Hospital, Bayamón, P.R.
Trader, Charles Weldon	United States Naval Hospital, Portsmouth, Va.
Tunney, Robert Boone	Mercy Hospital, Baltimore, Md.
Van Lill, Stephen Joseph, III	Delaware Hospital, Wilmington, Del.
Varhol, Joseph Gregory, Jr.	Paterson General Hospital, Paterson, N. J.
Wachsman, Irvin Louis	Sinai Hospital, Baltimore, Md.
Walker, Samuel Haywood	Delaware Hospital, Wilmington, Del.
Warren, Frank Orville, Jr.	Hartford Municipal Hospitals, Hartford, Conn.
Webster, Thomas Clyde	Maryland General Hospital, Baltimore, Md.
Weiss, Maurice Richard	Los Angeles County General Hospital, Los Angeles, Calif.
Wich, Joseph Carlton	Mercy Hospital, Baltimore, Md.
Williamson, Oliver Wayne	United States Naval Hospital, Parris Island, S. C.
Wilson, Thomas Leslie	University Hospital, Baltimore, Md.
Wise, Robert Edward	United States Naval Hospital, Philadelphia, Pa.
Wooddy, Arthur Overton	United States Naval Operating Base Hospital, Norfolk, Va.
Worgan, David Kuykendall	University Hospital, Baltimore, Md.
Yurko, Leonard Emory	Hartford Municipal Hospitals, Hartford, Conn.

MATRICULATES

SENIOR CLASS, JUNE 25, 1942 TO MARCH 23, 1943

Adam, Alberto Lotfalla, *Villanova College*.......Puerto Rico
Aderholdt, Marcus Lafayette, Jr., *A.B., University of North Carolina, 1937, University of North Carolina School of Medicine 1937–1938, 1939–1941* North Carolina
Allsopp, Richard Charles, *University of Pittsburgh*.......Pennsylvania
Almodóvar, Ramón Ignacio, *West Virginia University*.......Puerto Rico
Baker, Emory Forester, *A.B., Stanford University, 1939*.......Washington
Barnes, John David, *A.B., Harvard University, 1937*.......Massachusetts
Berry, Robert Zinn, *A.B., West Virginia University, 1939; B.S. West Viriginia University School of Medicine, 1939–1941*.......West Virginia
Bizzell, James Wooten, *B.S., Wake Forest College, 1939; Wake Forest College School of Medicine, 1939–1941*.......North Carolina
Bowen, Charles Vernon, Jr., *B.S., University of Maryland, 1939*.......Maryland
Brennan, Thomas Joseph, *B.S., Loyola College, 1939*.......Maryland
Brinton, Sherman Simons, *A.B., University of Utah, 1940; University of Utah School of Medicine, 1939–1941*.......Utah
Brooks, Ralph King, *A.B., West Virginia University, 1939*.......West Virginia
Brooks, Ross Chilton, *B.S., Loyola College, 1939*.......Maryland
Bryson, William James, *A.B., Western Maryland College, 1939*.......Maryland
Chenowith, Ralph Stallings, *Loyola College*.......Maryland
Cohen, Harry, *B.S., University of Maryland, 1939*.......Maryland
Coughlin, John Benedict, *B.S., Niagara University, 1939*.......Pennsylvania
Courtney, Donald Lawrence, *University of Oregon*.......Oregon
Crastnopol, Philip, *B.S., University of Maryland, 1938*.......New Jersey
Cusani, Benedict Albert, *B.S., Villanova College, 1939*.......Florida
Dalmáu, Miguel Sebastian, *B.S., University of Puerto Rico, 1939*.......Puerto Rico
Davis, William Joseph Graham, *A.B., University of North Carolina, 1939* District of Columbia
Diorio, John Daniel, *B.S., Mount St. Mary's College, 1939*.......Connecticut
Dunne, Thomas Benjamin, *A.B., The Johns Hopkins University, 1939*.......New York
Eaton, William Robert, *A.B., St. John's College, 1936*.......Maryland
Epperson, John Wallace Walker, *B.S., University of Maryland, 1941*.......Maryland
Fowler, Richard Lowman, *B.S., The Citadel, 1938*.......North Carolina
French, Samuel Lawson, *A.B., American University, 1935*.......Maryland
Friedman, Paul Norman, *A.B., The Johns Hopkins University, 1939*.......Maryland
Garrison, Alfred Selman, *A.B., Western Maryland College, 1940*.......Maryland
Giglia, Tony Robert, Jr., *A.B., West Virginia University, 1939*.......West Virginia
Goldberg, Raymond Bernard, *A.B., The Johns Hopkins University, 1935*.......Maryland
Grave de Peralta, José Ignacio, *B.S., University of Maryland, 1939*.......Cuba
Gray, David Benoni, *B.S., West Virginia Wesleyan College, 1938*.......West Virginia
Hagan, William Baker, *B.S., University of Maryland, 1941*.......Maryland
Hassler, Frank Stanley, III, *A.B., University of Pennsylvania, 1939*.......Pennsylvania
Honigman, Alvin Herbert, *B.S., University of Maryland, 1939*.......Maryland
Hunt, William Jack, *B.S., Wake Forest College, 1939; Wake Forest College School of Medicine, 1939–1941*.......North Carolina
Jenkins, William Romulus, *B.S., The Citadel, 1938; University of North Carolina School of Medicine, 1939–1941*.......North Carolina
Keadle, Robert Franklin, *B.S., University of North Carolina, 1940; University of North Carolina School of Medicine, 1939–1941*.......Maryland
La Mar, Robert Charles, Jr., *Goshen College*.......Maryland
Lee, Ferdinand Wayne, *A.B., West Virginia University, 1940; West Virginia University School of Medicine, 1939–1941*.......West Virginia
Lewis, Richard Quarles, *A.B., Duke University, 1939*.......Maryland
Livingstone, Robert Charles, *A.B., West Virginia University, 1939*..West Virginia
Lukats, Paul George, *University of Akron*.......Ohio
MacDonald, Charles Renwick, *B.S., University of Maryland, 1941*.......Maryland
Matchar, Joseph Charles, *A.B., The Johns Hopkins University, 1939*.......Maryland
McMillan, Marcy Emory, Jr., *West Virginia University*.......West Virginia
Mele, Vincent James, Jr., *B.S., Seton Hall College, 1937*.......New Jersey

Méndez, Néstor Hernan, *B.S., University of Puerto Rico, 1939*.......... Puerto Rico
Miller, James Delmar, *A.B., Ohio State University, 1939*.......... Ohio
Minervini, Robert Virginius, *A.B., Columbia University, 1938*.......... New York
Morris, John David, *A.B., West Virginia University, 1940; West Virginia University School of Medicine, 1939–1941*.......... West Virginia
Musnick, Henry, *A.B., The Johns Hopkins University, 1939*.......... Maryland
Myers, Joseph Carl, A. B., *Western Maryland College, 1939*.......... Maryland
Nash, Kenneth Powell, *University of California, 1939*.......... California
Neff, Charles Amos, *A.B., Goshen College, 1938*.......... Illinois
Parés, Maria Amalia, *B.S., University of Puerto Rico, 1939*.......... Puerto Rico
Parrott, Frank Strong, *B.S., Wake Forest College, 1939; Wake Forest College School of Medicine, 1939–1941*.......... North Carolina
Pérez, Enrique, *A.B., New York University, 1939*.......... Puerto Rico
Perry, Henry Baker, Jr., *Wake Forest College, 1940; Wake Forest College School of Medicine, 1939–1941*.......... North Carolina
Peterson, Preston Horsley, *University of Utah*.......... Utah
Queen, Joseph Emmett, *A.B., Loyola College, 1939*.......... Maryland
Rangle, Raymond Veto, *B.S., University of Maryland, 1941*.......... Maryland
Renshaw, Josephine Elizabeth, *B.S., University of Wisconsin, 1932; M.S., Wellesley College, 1933*.......... Maryland
Richards, Granville Hampton, *A.B., Franklin and Marshall College, 1939*.. Maryland
Robbins, Martin Albert, *A.B., The Johns Hopkins University, 1939*.......... Maryland
Rosenstein, Louis Nathan, *B.S., University of Maryland, 1939*.......... Maryland
Royer, Earl Linwood, *Bridgewater College*.......... Maryland
Rude, Richard Sprogoe, *Washington and Lee University*.......... New Jersey
Sacks, Seymour, *A.B., The Johns Hopkins University, 1939*.......... Maryland
Samuels, Irving Leonard, *A.B., Duke University, 1939*.......... Maryland
Sharp, Nathaniel, *Loyola College*.......... Maryland
Sigler, John Wiltshire, *A.B., Ohio State University, 1939*.......... Ohio
Soler-Favale, Marta Emilia, *B.S., University of Puerto Rico, 1939*.......... Puerto Rico
Spier, Andrew Allan, *A.B., The Johns Hopkins University, 1939*.......... Maryland
Stafford, Harold Rellinger, *Juniata College*.......... Michigan
Stewart, Edwin Harvey, Jr., *The Johns Hopkins University*.......... Maryland
Stier, Howard William, *A.B., The Johns Hopkins University, 1939*.......... New Jersey
Stoner, James Ernest, Jr., *A.B., Western Maryland College, 1939*.......... Maryland
Taylor, Irving Julian, *A.B., The Johns Hopkins University, 1939*.......... Maryland
Torres, José Manuel, *B.S., Manhattan College, 1939*.......... Puerto Rico
Trader, Charles Weldon, *A.B., Western Maryland College, 1939*.......... Maryland
Tunney, Robert Boone, *B.S., Loyola College, 1939*.......... Maryland
Van Lill, Stephen Joseph, III, *A.B., Duke University, 1938*.......... Maryland
Varhol, Joseph Gregory, Jr., *B.S., Rutgers University, 1939*.......... New Jersey
Wachsman, Irvin Louis, *The Johns Hopkins University*.......... Maryland
Walker, Samuel Haywood, *B.S., Davidson College, 1939*.......... North Carolina
Warren, Frank Orville, Jr., *University of New Hampshire*.......... New Hampshire
Webster, Thomas Clyde, *Loyola College*.......... Maryland
Weiss, Maurice Richard, *University of Pittsburgh*.......... Pennsylvania
Wich, Joseph Carlton, *Loyola College*.......... Maryland
Williamson, Oliver Wayne, *B.S., University of North Carolina, 1940; University of North Carolina School of Medicine, 1939–1941*.......... North Carolina
Wilson, Thomas Leslie, *University of Maryland*.......... Maryland
Wise, Robert Edward, *University of Pittsburgh*.......... Pennsylvania
Woody, Arthur Overton, *Duke University*.......... Maryland
Worgan, David Kuykendall, *B.S., University of Maryland, 1941*.......... Maryland
Yurko, Leonard Emory, *A.B., West Virginia University, 1939*.......... West Virginia

JUNIOR CLASS, JUNE 25, 1942 TO MARCH 23, 1943

Acton, Elizabeth, *A.B., American University, 1940*.......... New Jersey
Baldwin, Ruth Workman, *University of Maryland*.......... Illinois
Ballard, William Riley, Jr., *A.B., West Virginia University, 1940*.......... West Virginia
Bennett, Lillian Feykert, *A.B., M.A., University of California, 1938, 1939*.. California
Berry, Herbert Lee, *University of Southern California*.......... Arizona
Bitsack, Joseph William, *A.B., The Johns Hopkins University, 1940*.......... New Jersey
Brandt, Frederick Bertram, *University of Maryland*.......... District of Columbia

Brobst, Henry Thomas, *A.B., Oberlin College, 1940*	Pennsylvania
Brown, Charles William, *A.B., West Virginia University, 1940*	Pennsylvania
Brown, James Mack, *A.B., University of Alabama, 1940*	Alabama
Colon-Yordan, Ernesto, *A.B., University of Puerto Rico, 1940*	Puerto Rico
Cook, Elmer Ellsworth, Jr., *University of Maryland*	Maryland
Corpening, William Nye, *A.B., University of North Carolina, 1940*	North Carolina
Crosby, Robert MacGonigle Nelson, *The Johns Hopkins University*	Maryland
Curtiss, Robert Kimber, *A.B., Colgate University, 1940*	New York
Dann, Alfred Henry, *A.B., The Johns Hopkins University, 1940*	Maryland
Day, Edward Colson, *A.B., College of Wooster, 1939*	New York
Dillon, Harold, *B.S., University of Maryland, 1940*	Maryland
Dorman, Hamilton Peacock, *B.S., Bates College, 1940*	District of Columbia
Doyle, John Justin, *B.S., Boston College, 1940*	Massachusetts
Ehrlich, Daniel, *A.B., The Johns Hopkins University, 1940*	Maryland
Ferri, Henry Guy, *B.S.,University of Pittsburgh, 1940*	Pennsylvania
Finegold, Aaron Nathan, *B.S., University of Pittsburgh, 1940*	Pennsylvania
Foley, Mary Jane, *A.B., B.S., West Virginia University, 1941; West Virginia University School of Medicine 1940–1942*	West Virginia
Frye, Augustus Homer, Jr., *B.S., University of Georgia, 1939*	Georgia
Galitz, Eli, *A.B., New York University, 1939*	New York
Garrett, Richard Mitchell, *Emory University*	Alabama
Gubnitsky, Albert, *B.S., University of Maryland, 1940*	Maryland
Guyther, Joseph Roy, *University of Maryland*	Maryland
Harris, William Myrick, *West Virginia University*	Maryland
Haught, John Stevenson, *West Virginia University*	West Virginia
Hornbrook, Francis Eugene, *A.B., B.S., West Virginia University, 1941, 1942; West Virginia University School of Medicine, 1940–1942*	West Virginia
Iguina-Jimenez, Manuel Antonio, *B.S., University of Puerto Rico, 1941*	Puerto Rico
Ingenito, Gabriel Andrew, *A.B., University of Connecticut, 1940*	Connecticut
Ingram, Charles Hal, *A.B., Duke University, 1940*	North Carolina
Isales, Luis Manuel, *B.S., University of Puerto Rico, 1939*	Puerto Rico
Jaworski, Melvin Joseph, *B.S., University of Maryland, 1940*	Maryland
Keeney, Dan Franklin, *University of Maryland*	Maryland
Kemper, Charles Alexander, *A.B., Duke University, 1940*	Maryland
Kinney, Earl Ray, *A.B., University of Kansas, 1940*	West Virginia
Kirby, Ishmael Worth, *B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*	North Carolina
Kleiman, Allen, *A.B., The Johns Hopkins University, 1940*	Maryland
Latimer, Clarence Vinette, Jr., *A.B., Duke University, 1940*	New York
Lurting, Frederick Wilbur, *B.S., University of Pittsburgh, 1940*	Pennsylvania
Mamula, Peter, *A.B., West Virginia University, 1940*	West Virginia
Markowitz, Arnold Robert, *A.B., West Virginia University, 1940*	West Virginia
McCormack, Lloyd Leo, *University of Virginia*	New Jersey
McFadden, Robert Burns, *B.S., Loyola College, 1940*	Maryland
McGrath, William Edward, Jr., *A.B., Loyola College, 1939*	Maryland
McMullin, Joseph Frederick, *A.B., Ohio University, 1938*	Pennsylvania
Meade, DeVoe Kepler, *B.S., University of Maryland, 1940*	Maryland
Miranda, Angel Neftali, *University of Puerto Rico*	Puerto Rico
Morgan, Jack Calvin, *A.B., West Virginia University, 1940*	West Virginia
Myers, Myron Joseph, *A.B., The Johns Hopkins University, 1940*	Maryland
Nelson, Alfred Turner, *University of Michigan*	Maryland
Nesbitt, Isaac Floyd, *B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*	North Carolina
Ozazewski, John Casimir, *B.S., Loyola College, 1940*	Maryland
Palese, John Michael, *University of Maryland*	Maryland
Peters Robert Joseph, *West Virginia University*	Pennsylvania
Pfeil, Edgar Thornton, *University of Maryland*	Maryland
Pinas, Samuel Ronald, *B.S., University of Maryland, 1940*	Maryland
Pomeroy, William Henry, II, *B.S., Trinity College, 1938*	Connecticut
Raffucci-Arce, Francisco Luis, *University of Puerto Rico*	Puerto Rico
Range, James Jacob, *A.B., Duke University, 1940*	Tennessee
Ratliff, Cliff, Jr., *A.B., Duke University, 1940*	North Carolina
Ream, Norman, *B.S., Franklin and Marshall College, 1940*	Pennsylvania
Recht, John Munn, *A.B., Gettysburg College, 1940*	New Jersey

Rinehart, Arthur Middleton, *B.S., Trinity College, 1940*	Maryland
Robertson, Merritt Ezekiel, *A.B., Tusculum College, 1940*	North Carolina
Rogers, George Carraway, *A.B., University of North Carolina, 1939*	North Carolina
Rogers, William Brannon, Jr., *B.S., University of Akron, 1940*	Ohio
Santiago, Stevenson Parker, *A.B., Maryville College, 1940*	Puerto Rico
Sapareto, Rocco Louis, *B.S., Tufts College, 1939*	Massachusetts
Scherlis, Irving, *A.B., The Johns Hopkins University, 1940*	Maryland
Shipley, Frank Mollman, *A.B., Western Maryland College, 1940*	Maryland
Shortle, James Samuel, *B.S., University of New Mexico, 1939*	New Mexico
Sones, Frank Mason, Jr., *A.B., Western Maryland College, 1940*	Maryland
Stegall, John Thomas, *B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*	North Carolina
Sterling, Harold, *B.S., University of Maryland, 1940*	District of Columbia
Strobel, Martin Edward, *A.B., Gettysburg College, 1940*	Maryland
Summerlin, Glenn Olson, *Emory University*	Florida
Thompson, Talmadge Stanley, *University of Maryland*	Maryland
Tilt, Leroy Wortendyke, Jr., *A.B., Oberlin College, 1939*	Maryland
Vargas, Dharma Luz, *B.S., University of Puerto Rico, 1940*	Puerto Rico
Waldrop, Grayson Spencer, *A.B., University of North Carolina, 1940*	North Carolina
Walkup, Harry Ernest, *West Virginia University*	West Virginia
West, George Brooks, Jr., *B.S., College of William and Mary, 1940*	Virginia
Will, David Reid, *Ohio State University*	Ohio
Williams, Thomas Richard, Jr., *A.B., Duke University, 1940*	North Carolina
Ziegler, Paul Randall, *University of Maryland*	Maryland

SOPHOMORE CLASS, JUNE 25, 1942 TO MARCH 23, 1943

Alvarez, José Alberto, *University of Puerto Rico*	Puerto Rico
Anchell, Melvin, *B.S., University of Maryland, 1941*	Maryland
Ardinger, Joseph Stanley, Jr., *B.S., University of Maryland, 1943*	Maryland
Bacon, Arthur Maynard, Jr., *B.S., Loyola College, 1941*	Maryland
Bell, Houston Lesher, *B.S., University of Maryland, 1943*	Maryland
Bloxom, John Madison, III, *B.S., University of Virginia, 1941*	Virginia
Brady, Charles Eldon, *A.B., University of North Carolina, 1939*	North Carolina
Brady, Frank Joseph, *B.S., Washington College, 1941*	Maryland
Brandes, Herbert Gibbs, *B.S., University of Maryland, 1943*	District of Columbia
Brill, Warren Daniel, *B.S., University of Maryland, 1941*	Maryland
Brown, Richard James, *B.S., University of Maryland, 1943*	Connecticut
Buckey, Robert Bruce, *A.B., University of New Mexico, 1941*	Maryland
Callahan, Daniel Harry, Jr., *B.S., Bowdoin College, 1941*	Massachusetts
Carr, Charles Edwin, Jr., *B.S., Loyola College, 1941*	Maryland
Chaput, Charles Dupre, *A.B., Dartmouth College, 1941*	Massachusetts
Cintrón, Miguel, *West Virginia University*	Puerto Rico
Cloninger, Rowell Connor, *A.B., Lenoir Rhyne College, 1942*	North Carolina
Copeland, Herbert Bernard, Jr., *West Virginia University*	West Virginia
Cowley, R. Adams, *University of Utah*	Utah
Dodd, Patricia, *B.S., University of Maryland, 1943*	Georgia
Doukas, James A., *B.S., Washington College, 1941*	Maryland
Drake, Miles Edward, *B.S., MS., Oregon State College, 1933, 1934; Ph.D., University of Southern California, 1938*	Maryland
Ebeling, William Carl, III, *B.S., University of Maryland, 1943*	Maryland
Elias, Thomas Glenn, *A.B., Western Maryland College, 1941*	Maryland
Everett, John Thomas, *B.S., Mt. St. Mary's College, 1941*	Maryland
Farkas, Robert William, *A.B., University of Maryland, 1941*	Pennsylvania
Feaster, James Henry, Jr., *A.B., West Virginia University, 1941*	West Virginia
Feldman, Maurice, Jr., *A.B., The Johns Hopkins University, 1941*	Maryland
Foard, Wilbur Harper, *Asbury College*	Maryland
Futterman, Perry, *A.B., The Johns Hopkins University, 1941*	Maryland
García y García, José Antonio, *B.S., University of Puerto Rico, 1941*	Puerto Rico
Gassaway, Franklyn Drennan, *B.S., University of Maryland, 1943*	Arizona
Godlove, John Carlton, *A.B., Dickinson College, 1933*	Maryland
Goldstein, Marvin, *A.B., The Johns Hopkins University, 1941*	Maryland
Grumbine, Francis Levine, *A.B., Western Maryland College, 1941*	Maryland
Guthrie, William Wilkinson, *A.B., University of Pennsylvania, 1941*	West Virginia

Hamill, James Edward, *B.S., University of Maryland, 1941*	Maryland
Hayden, Richard Carroll, *B.S., University of Maryland, 1943*	Maryland
Herold, Paul Garmer, *Duke University*	Maryland
Hobelmann, Charles Frederick, *A.B., The Johns Hopkins University, 1941*	Maryland
Holljes, Henry Wirt Duvall, *A.B., Western Maryland College, 1941*	Maryland
Horn, Helen Amelia, *A.B., Goucher College, 1941*	Maryland
Houska, Henry John, *A.B., Loyola College, 1941*	Maryland
Ingram, Phyllis Ray, *University of Vermont*	Maryland
Jernigan, John Mayo, Jr., *University of Maryland*	Maryland
Jones, Bobby Lee, *B.S., University of Maryland, 1941*	Maryland
Kishpaugh, Marjorie Bird, *B.S., Lebanon Valley College, 1941*	Pennsylvania
Kreis, George Joseph, Jr., *University of Maryland*	Maryland
Lambert, Herman James, Jr., *B.S., University of Hawaii, 1941*	Georgia
Lampley, William Askew, *B.S., Furman University, 1941*	North Carolina
Lerman, Philip H., *University of Maryland*	Maryland
Levine, Stuart Charles, *B.S., University of Maryland, 1941*	Maryland
Lilienfeld, Abraham Morris, *A.B., The Johns Hopkins University, 1941; Albany Medical College, 1941–1942*	Maryland
Littlefield, James Beaton, *A.B., University of Virginia, 1941*	Massachusetts
[1]Lord, Harrison Luther, *University of Maryland*	Maryland
Maxwell, George Alexander, Jr., *B.S., University of Maryland, 1943*	Maryland
Milloff, Bernard, *B.S., University of Maryland, 1941*	Maryland
Mintzer, Donald Willis, *B.S., University of Maryland, 1943*	New Jersey
Mosberg, William Henry, Jr., *B.S., University of Maryland, 1943*	Maryland
Norment, Richard Baxter, III, *B.S., University of Maryland, 1943*	Maryland
O'Donnell, Charles Francis, *The Johns Hopkins University*	Maryland
Osborne, William Wilson, *University of Georgia*	Georgia
Patterson, Carl Norris, *B.S., Franklin and Marshall College, 1941*	Maryland
Pierpont, Edwin Lowell, *B.S., University of Maryland, 1943*	Maryland
Pool, Champe Clark, *A.B., West Virginia University, 1941*	West Virginia
Pratt, Louis John, *B.S., Loyola College, 1941*	Maryland
Ramundo, Michael Raymond, *A.B., Syracuse University, 1941*	New Jersey
Randolph, Edward Burl, *West Virginia University*	West Virginia
Rees, David Thomas, *A.B., West Virginia University, 1938*	Pennsylvania
Riley, Eugene John, *B.S., University of Maryland, 1943*	Maryland
Robbins, Morris Allen, *A.B., University of Pennsylvania, 1941*	New Jersey
Rolfes, Harry Franklin, *B.S., University of Maryland, 1943*	Maryland
Rubenstone, Albert Irving, *A.B., University of Pennsylvania, 1941*	Maryland
Scavone, Edmond, *B.S., Loyola College, 1941*	Maryland
Schwartz, Aaron David, *A.B., University of Pennsylvania, 1941*	New York
Seabright, Howard Lee, *A.B., Washington and Jefferson College, 1941*	West Virginia
Shaw, Charles Edward, Jr., *B.S., University of Maryland, 1943*	Maryland
Simons, George Murray, *B.S., University of Maryland, 1943*	Maryland
Spelsberg, Walter Karl, *B.S., University of Maryland, 1943*	West Virginia
Steinberg, Stanley Herbert, *B.S., University of Maryland, 1943*	District of Columbia
Stichel, Frederick Louis, Jr., *B.S., University of Maryland, 1943*	Maryland
Thompson, Lewis Bradford, *Dartmouth College*	Massachusetts
Tinker, Francis Paul, *B.S., Loyola College, 1941*	Maryland
Traband, Millard Tolson, Jr., *University of Maryland*	Maryland
Turner, Roy Byron, Jr., *University of Maryland*	District of Columbia
Ullsperger, John Francis, *A.B., Loyola College, 1941*	Maryland
Wehling, Benjamin Bird, *B.S., Wheaton College, 1941*	Ohio
Wilson, Mary Stuart, *A.B., Randolph-Macon College, 1941*	Maryland
Wooden, Allen Curtis, *B.S., Wake Forest College, 1941*	Maryland
Woodrum, Olin Cain, *The Johns Hopkins University*	Maryland
Yaffe, Stanley Norman, *B.S., University of Maryland, 1941*	Maryland

FRESHMAN CLASS, JUNE 25, 1942 TO MARCH 23, 1943

Amsterdam, Benjamin, *B.S., University of Maryland, 1942*	New Jersey
Anderson, George Hagan, *B.S., University of Florida, 1942*	Florida
Arnold, Gayle Gardner, *A.B., The Johns Hopkins University, 1942*	Maryland
Ayd, Frank Joseph, Jr., *A.B., Loyola College, 1942*	Maryland

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[1] Withdrew, in good standing, March 26, 1943.

Barker, David Hargis, *B.S., University of Maryland, 1943*	Maryland
Barnes, Thomas Gordon, *A.B., Emory University, 1942*	Georgia
Baroody, Philip Charles, *A.B., St. Anselm's College, 1942*	New Hampshire
Bell, David Fowler, Jr., *B.S., University of Maryland, 1942*	Maryland
Berdiansky, Benjamin, *A.B., The Johns Hopkins University, 1942*	Maryland
Brannen, Joseph Harrison, *A.B., Emory University, 1942*	Georgia
Brendle, William Kendig, *B.S., University of Maryland, 1942*	Maryland
Brosemer, Lowell Russell, *A.B., University of California, 1942*	California
Byrne, Robert Francis *B.S., University of Maryland, 1943*	Maryland
Callender, George, Russell, Jr., *University of Maryland*	District of Columbia
Camponeschi, Oscar Wilde, *B.S., University of Maryland, 1942*	Maryland
[1]Cano, Harold Vernon, *University of Maryland*	New Jersey
Canter, Nathan, *B.S., Loyola College, 1942*	Maryland
Clark, Mary Dorcas, *West Virginia University*	Pennsylvania
Conlon, Andrew Joseph, *A.B., Loyola College, 1942*	Maryland
Conner, Eugene Hayward, *University of Maryland*	Maryland
Cook, Sallie, *A.B., University of Pennsylvania, 1942*	Maryland
Davis, John Bernard, *University of Maryland*	Maryland
Davis, Ralph Fletcher, *B.S., University of Maryland 1942*	Maryland
de Alba, Eduardo, Jr., *A.B., The Johns Hopkins University, 1942*	Republic of Panama
Dennis, John Murray, *University of Maryland*	Maryland
Doenges, John Pell, *A.B., Western Maryland College, 1942*	Maryland
Faber, James Dovener, *A.B., West Virginia University, 1942*	West Virginia
Fitzpatrick, Vincent dePaul, Jr., *A.B., Loyola College, 1942*	Maryland
Frank, William Henry, *University of Pittsburgh*	Pennsylvania
Ganey, Joseph Brannen, *A.B., Emory University, 1942*	Florida
[1]Gardner, Wendell Whitehead, *B.S., University of Utah, 1942*	Utah
Givens, Austin Edward, *A.B., Pomona College, 1942*	Maryland
Greenleaf, Helen Emily, *B.S., Bucknell University, 1941*	New Jersey
Hall, Arthur Thomas, Jr., *B.S., Loyola College, 1942*	Maryland
Hamburger, Daniel Oscar, *A.B., The Johns Hopkins University, 1942*	Maryland
Hansen, Frank William, *B.S., Loyola College, 1942*	Maryland
Haskins, John Bunyan, *University of Chattanooga*	Tennessee
Haynes, Howard Harry, Jr., *University of Utah*	Utah
Hedrick, John Albert, *Marshall College*	West Virginia
Hennessy, John Francis, *A.B., The Johns Hopkins University, 1942*	New Jersey
Herndon, Albert Bivings, Jr., *A.B., Emory University, 1942*	Florida
Herrick, Stanley Edward, Jr., *B.S., Bowdoin College, 1942*	Massachusetts
Herrmann, Albert Casper, *University of Maryland*	Maryland
[1]Hill, Harry Edward, *B.S., University of Maryland, 1942*	Maryland
Holbrook, William Addison, Jr., *B.S., University of Maryland, 1942*	Maryland
Hoyos-Napoleoni, Hector Anthony, *West Virginia University*	Puerto Rico
Hutchins, Harry, *Emory University*	Georgia
Keister, Stephen Ridinger, *Duke University*	Pennsylvania
Kelly, Alexander Palmer, Jr., *University of Maryland*	North Carolina
Kenworthy, Richard Albert, III, *Yale University*	Maryland
Kurland, Leonard Terry, *A.B., The Johns Hopkins University, 1942*	Maryland
Lemen, Daniel Bair, *University of Maryland*	Maryland
Linthicum, Charles Milton, *University of Maryland*	Maryland
Maconachy, William Victor, *B.S., Loyola, 1941*	Maryland
Maguire, Henry Francis, *B.S., Washington College, 1942*	New Jersey
Mannix, Joseph Francis, *St. Vincent College*	Pennsylvania
McNinch, James Robinson, Jr., *A.B., Washington & Jefferson College, 1942*	Pennsylvania
Miller, Clarence Stockton, *University of Nevada*	Maryland
Myers, Paul Robert, *A.B., Western Maryland College, 1942*	Maryland
Norton, Alfred Simpson, *University of Maryland*	District of Columbia
O'Neill, Allen Jay, *University of Maryland*	Virginia
Ott, Roy Hamilton, Jr., *A.B., Williams College, 1942*	New York
Owen, Arthur John, *A.B., Loyola College, 1942*	Maryland
Peck, Robert DeWitt, A.B., *West Virginia University, 1942*	West Virginia
Phillips, Malcolm Dudley, *Houghton College*	Maryland
Pike, Warren Horton, Jr., *B.S., Virginia Military Institute, 1942*	Indiana

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[1] Did not complete the year—illness.

Reahl, Joseph Edward, *B.S., Loyola College, 1942*........Maryland
Robinson, William Henry, *The Johns Hopkins University*........Maryland
Rosenblatt, Leah, *A.B., Hood College, 1942*........Maryland
Rosenthal, John Lauchheimer, *A.B., The Johns Hopkins University, 1942*...Maryland
Rudo, Alvin David, *The Johns Hopkins University*........Maryland
Rudo, Marvin, *B.S., University of Maryland, 1942*........Maryland
Sanchez, Hilarion, Jr., *West Virginia University*........Puerto Rico
Sokolski, Edward John, *A.B., Norwich University, 1942*........Connecticut
Stedem, Anthony Frederick Augustine, Jr., *A.B., Loyola College, 1942*.....Maryland
Steinbach, Stanley Roy, *A.B., The Johns Hopkins University, 1942*........Maryland
Stewart, Charles Wilbur, Jr., *The Johns Hopkins University*........Maryland
Strahan, Charles, Jr., *B.S., Dickinson College, 1942*........Maryland
Street, Russell Barber, Jr., *University of Wisconsin*........Massachusetts
Summerlin, Winston Lee, *University of Florida*........Florida
Tansey, John Jerome, *Brown University*........Massachusetts
Touchet, Mary Louise, *University of Maryland*........Maryland
Trevaskis, Allan Edward, *Harvard University*........Maryland
Trumbo, Robert Benson, *Emory University*........Florida
Wagner, Victor, *University of Pennsylvania*........New Jersey
Weakley, Emma Jane, *University of Maryland*........Maryland
Weinberg, Harold Herbert, *B.S., Loyola College, 1942*........Maryland
Weintraub, Joseph, *B.S., University of Maryland, 1942*........Maryland
Wheeler, Thomas Easson, *The Johns Hopkins University*........Maryland
White, Joseph McCurley, III, *B.S., Loyola College, 1942*........Maryland
Winslow, Oliver Parry, Jr., *The Johns Hopkins University*........Maryland
Woodward, Arthur Fletchall, *B.S., University of Maryland, 1942*........Maryland
Ziegler, John Bosley, *A.B., Gettysburg College, 1942*........Maryland
Zinberg, Norman Earl, *B.S., University of Maryland, 1942*........Maryland

SUMMARY OF STUDENTS

(June 25, 1942 to March 23, 1943)

	Male	*Female*	*Tota*
Senior Class	95	3	98
Junior Class	85	5	90
Sophomore Class	86	5	91
Freshman Class	88*	6	94
	354	19	373
Withdrawals *3	3	0	3
	351	19	370

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

(June 25, 1942 to March 23, 1943)

Alabama	2
Arizona	2
California	3
Connecticut	5
District of Columbia	9
Florida	7
Georgia	7
Illinois	2
Indiana	1
Maryland (Baltimore 119)	184
Massachusetts	10
Michigan	1
New Hampshire	2
New Jersey	18
New Mexico	1
New York	8
North Carolina	23
Ohio	6
Oregon	1
Pennsylvania	21
Tennessee	2
Utah	5
Virginia	3
Washington	1
West Virginia	28
Foreign	
Cuba	1
Panama, R.P.	1
Puerto Rico	20

LIST OF COLLEGE SOURCES OF STUDENTS ENROLLED

Session—June 25, 1942 to March 23, 1943

Akron University	1
Alabama, University of	1
American University	2
Asbury College	1
Bates College	1
Boston College	1
Bowdoin College	2
Brown University	1
Bucknell University	1
California, University of	3
Chattanooga, University of	1
Colgate University	1
Columbia University	1
Connecticut, University of	1
Dartmouth College	2
Davidson College	1
Dickinson College	1
Duke University	11
Emory University	8
Florida, University of	11
Franklin & Marshall College	3
Furman University	1
Georgia, University of	2
Gettysburg College	3
Goshen College	2
Goucher College	1
Harvard University	2
Hawaii, University of	1
Hood College	1
Houghton College	1
Johns Hopkins University, The	39
Juniata College	1
Kansas, University of	1
Lebanon Valley College	1
Lenoir Rhyne College	1
Loyola College	26
Manhattan College	1
Marshall College	1
Maryland, University of	86
Maryville College	1
Michigan, University of	1
Mt. St. Mary's College	2
Nevada, University of	1
New Hampshire, University of	1
New Mexico, University of	2
New York University	2
Niagara University	1
North Carolina, University of	11
Norwich University	1
Oberlin College	2
Ohio State University	3
Ohio University	1
Oregon State College	1
Oregon, University of	1
Pennsylvania, University of	7
Pittsburgh, University of	6
Pomona College	1
Puerto Rico, University of	12
Randolph-Macon College	1
Rutgers University	1
St. Anselm's College	1
St. John's College	1
St. Vincent College	1
Seton Hall College	1
Southern California, University of	2
Stanford University	1
Syracuse University	1
The Citadel	2
Trinity College	2
Tufts College	1
Tusculum College	1
Utah, University of	5
Vermont, University of	1
Villanova College	2
Virginia Military Institute	1
Virginia, University of	3
Wake Forest College	5
Washington College	3
Washington & Jefferson College	2
Washington & Lee University	1
Wellesly College	1
Western Maryland College	12
West Virginia University	32
Wheaton College	1
Williams College	1
William & Mary, College of	1
Wisconsin, University of	2
Wooster, College of	1
Yale University	1

INTERNSHIPS—CANDIDATES FOR GRADUATION ON DECEMBER 23, 1943

Effective January 1, 1944

Acton, Elizabeth	Baltimore City Hospitals, Baltimore, Md.
Baldwin, Ruth Workman	West Baltimore General Hospital, Baltimore, Md.
Ballard, William Riley, Jr.	California Hospital, Los Angeles, Calif.
Bennett, Lillian Feykert	Massachusetts General Hospital, Boston, Mass.
Berry, Herbert Lee	San Diego County General Hospital, San Diego, Calif.
Bitsack, Joseph William	St. Vincent's Hospital, New York, N. Y.
Brandt, Frederick Bertram	Garfield Memorial Hospital, Washington, D. C.
Brobst, Henry Thomas	Indiana University Medical Center, Indianapolis, Ind.
Brown, Charles William	Western Pennsylvania Hospital, Pittsburgh, Pa.
Brown, James Mack	Henry Ford Hospital, Detroit, Mich.
Colon-Yordan, Ernesto	Providence Hospital, Detroit, Mich.
Cook, Elmer Ellsworth	Mercy Hospital, Baltimore, Md.
Corpening, William Nye	University Hospital, Baltimore, Md.
Crosby, Robert MacGonigle Nelson	Mercy Hospital, Baltimore, Md.
Curtiss, Robert Kimber	Syracuse University Medical Center Hospitals, Syracuse, N. Y.
Dann, Alfred Henry	Sinai Hospital, Baltimore, Md.
Day, Edward Colson	Union Memorial Hospital, Baltimore, Md.
Dillon, Harold	Sinai Hospital, Baltimore, Md.
Dorman, Hamilton Peacock	Mercy Hospital, Pittsburgh, Pa.
Doyle, John Justin	Worcester City Hospital, Worcester, Mass.
Ehrlich, Daniel	Baltimore City Hospitals, Baltimore, Md.
Ferri, Henry Guy	St. Francis Hospital, Pittsburgh, Pa.
Finegold, Aaron Nathan	Montefiore Hospital, Pittsburgh, Pa.
Foley, Mary Jane	Mercy Hospital, Baltimore, Md.
Frye, Augustus Homer, Jr.	Grady Memorial Hospital, Atlanta, Ga.
Galitz, Eli	Coney Island Hospital, Brooklyn, N. Y.
Garrett, Richard Mitchell	Methodist Hospital, Brooklyn, N. Y.
Gubnitsky, Albert	Lincoln Hospital, New York, N. Y.
Guyther, Joseph Roy	Mercy Hospital, Baltimore, Md.
Harris, William Myrick	Presbyterian Hospital, Denver, Col.
Haught, John Stevenson	University Hospital, Baltimore, Md.
Hornbrook, Francis Eugene	Mercy Hospital, Baltimore, Md.
Iguina-Jimenez, Manuel Antonio	Bayamón Charity District Hospital, Bayamón, P. R.
Ingenito, Gabriel Andrew	Grace Hospital, New Haven, Conn.
Ingram, Charles Hal	Medical College of Virginia, Hospital Division, Richmond, Va.
Isales, Luis Manuel	Mercy Hospital, Pittsburgh, Pa.
Jaworski, Melvin Joseph	University Hospital, Baltimore, Md.
Keeney, Dan Franklin	Garfield Memorial Hospital, Washington, D. C.
Kemper, Charles Alexander	University Hospital, Baltimore, Md.
Kinney, Earl Ray	Baltimore City Hospitals, Baltimore, Md.
Kirby, Ishmael Worth	Garfield Memorial Hospital, Washington, D. C.
Kleiman, Allen	Queens General Hospital, Jamaica, Long Island, N. Y.
Latimer, Clarence Vinette, Jr.	University Hospital, Baltimore, Md.
Lurting, Frederick Wilbur	University Hospital, Baltimore, Md.
Mamula, Peter	St. Francis Hospital, Pittsburgh, Pa.
Markowitz, Arnold Robert	University Hospital, Baltimore, Md.

McCormack, Lloyd Leo	Maryland General Hospital, Baltimore, Md.
McFadden, Robert Burns	Mercy Hospital, Baltimore, Md.
McGrath, William Edward, Jr.	St. Agnes Hospital, Baltimore, Md.
McMullin, Joseph Frederick	Washington Hospital, Washington, Pa.
Meade, DeVoe Kepler	Garfield Memorial Hospital, Washington, D. C.
Miranda, Angel Neftali	Hamot Hospital, Erie, Pa.
Morgan, Jack Calvin	Mercy Hospital, Baltimore, Md.
Myers, Myron Joseph	Sinai Hospital, Baltimore, Md.
Nelson, Alfred Turner	University Hospital, Baltimore, Md.
Nesbitt, Isaac Floyd	Medical College of Virginia, Hospital Division, Richmond, Va.
Ozazewski, John Casimir	Mercy Hospital, Baltimore, Md.
Palese, John Michael	Mercy Hospital, Baltimore, Md.
Peters, Robert Joseph	Mercy Hospital, Pittsburgh, Pa.
Pfeil, Edgar Thornton	University Hospital, Baltimore, Md.
Pinas, Samuel Ronald	Sinai Hospital, Baltimore, Md.
Pomeroy, William Henry, II	Hartford Hospital, Hartford, Conn.
Raffucci-Arce, Francisco Luis	Bayamón Charity District Hospital, Bayamón, P. R.
Range, James Jacob	University Hospital, Baltimore, Md.
Ratliff, Cliff, Jr.	University Hospital, Baltimore, Md.
Ream, Norman B.	Mercy Hospital, Pittsburgh, Pa.
Recht, John Munn	Morrisania City Hospital, New York, N. Y.
Rinehart, Arthur Middleton	University Hospital, Baltimore, Md.
Robertson, Merritt Ezekiel	University Hospital, Baltimore, Md.
Rogers, George Carraway	United States Naval Hospital
Rogers, William Brannon, Jr.	City Hospital, Akron, Ohio
Santiago, Stevenson Parker	Hamot Hospital, Erie, Pa.
Sapareto, Rocco Luis	Cambridge Hospital, Cambridge, Mass.
Scherlis, Irving	Sinai Hospital, Baltimore, Md.
Shipley, Frank Mollman	University Hospital, Baltimore, Md.
Shortle, James Samuel	University Hospital, Baltimore, Md.
Sones, Frank Mason, Jr.	University Hospital, Baltimore, Md.
Stegall, John Thomas	Medical College of Virginia, Hospital Division, Richmond, Va.
Sterling, Harold	Gallinger Municipal Hospital, Washington, D. C.
Strobel, Martin Edward	University Hospital, Baltimore, Md.
Summerlin, Glenn Olson	University Hospital, Baltimore, Md.
Thompson, Talmadge Stanley	University Hospital, Baltimore, Md.
Tilt, Leroy Wortendyke, Jr.	University Hospital, Baltimore, Md.
Vargas, Dharma Luz	Hamot Hospital, Erie, Pa.
Waldrop, Grayson Spencer	Roper Hospital, Charleston, S. C.
Walkup, Harry Ernest	Mercy Hospital, Pittsburgh, Pa.
West, George Brooks, Jr.	Mercy Hospital, Pittsburgh, Pa.
Will, David Reid	Henry Ford Hospital, Detroit, Mich.
Williams, Thomas Richard, Jr.	City Hospital, Winston-Salem, N. C.
Ziegler, Paul Randall	Mercy Hospital, Baltimore, Md.

MATRICULATES

SENIOR CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

Acton, Elizabeth, *A.B., American University, 1940*..................New Jersey
Baldwin, Ruth Workman, *University of Maryland*........................Illinois
Ballard, William Riley, Jr., *A.B., West Virginia University, 1940*....West Virginia
Bennett, Lilliam Feykert, *A.B., M.A., University of California, 1938, 1939*.California
Berry, Herbert Lee, *University of Southern California*..................Arizona
Bitsack, Joseph William, *A.B., The Johns Hopkins University, 1940*......New Jersey
Brandt, Frederick Bertram, *University of Maryland*............District of Columbia
Brobst, Henry Thomas, *A.B., Oberlin College, 1940*..................Pennsylvania
Brown, Charles William, *A.B., West Virginia University, 1940*........Pennsylvania
Brown, James Mack, *A.B., University of Alabama, 1940*..................Alabama
Colon-Yordan, Ernesto, *A.B., University of Puerto Rico, 1940*........Puerto Rico
Cook, Elmer Ellsworth, Jr., *University of Maryland*......................Maryland
Corpening, William Nye, *A.B., University of North Carolina, 1940*.....North Carolina
Crosby, Robert MacGonigle Nelson, *The Johns Hopkins University*.......Maryland
Curtiss, Robert Kimber, *A.B., Colgate University, 1940*..............New York
Dann, Alfred Henry, *A.B., The Johns Hopkins University, 1940*............Maryland
Day, Edward Colson, *A.B., College of Wooster, 1939*.....................New York
Dillon, Harold, *B.S., University of Maryland, 1940*.......................Maryland
Dorman, Hamilton Peacock, *B.S., Bates College, 1940*............District of Columbia
Doyle, John Justin, *B.S., Boston College, 1940*...................Massachusetts
Ehrlich, Daniel, *A.B., The Johns Hopkins University, 1940*...............Maryland
Ferri, Henry Guy, *B.S., University of Pittsburgh, 1940*..............Pennsylvania
Finegold, Aaron Nathan, *B.S., University of Pittsburgh, 1940*........Pennsylvania
Foley, Mary Jane, A.B., *West Virginia University, 1941; B.S., West Virginia University School of Medicine, 1942*.......................West Virginia
Frye, Augustus Homer, Jr., *B.S., University of Georgia, 1939*.............Georgia
Galitz, Eli, *A.B., New York University, 1939*..........................New York
Garrett, Richard Mitchell, *Emory University*...........................Alabama
Gubnitsky, Albert, *B.S., University of Maryland, 1940*.....................Maryland
Guyther, Joseph Roy, *University of Maryland*............................Maryland
Harris, William Myrick, *West Virginia University*........................Maryland
Haught, John Stevenson, *West Virginia University*................West Virginia
Hornbrook, Francis Eugene, A.B., *West Virginia University, 1941; B.S., West Virginia University School of Medicine, 1942*.................West Virginia
Iguina-Jimenez, Manuel Antonio, *B.S., University of Puerto Rico, 1941*..Puerto Rico
Ingenito, Gabriel Andrew, *A.B., University of Connecticut, 1940*......Connecticut
Ingram, Charles Hal, *A.B., Duke University, 1940*................North Carolina
Isales, Luis Manuel, *B.S., University of Puerto Rico, 1939*..............Puerto Rico
Jaworski, Melvin Joseph, *B.S., University of Maryland, 1940*................Maryland
Keeney, Dan Franklin, *University of Maryland*...........................Maryland
Kemper, Charles Alexander, *A.B., Duke University, 1940*................Maryland
Kinney, Earl Ray, *A.B., University of Kansas, 1940*................West Virginia
Kirby, Ishmael Worth, B.S. *University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*..................North Carolina
Kleiman, Allen, *A.B., The Johns Hopkins University, 1940*..................Maryland
Latimer, Clarence Vinette, Jr., *A.B., Duke University, 1940*............New York
Lurting, Frederick Wilbur, *B.S., University of Pittsburgh, 1940*........Pennsylvania
Mamula, Peter, *A.B., West Virginia University, 1940*..............West Virginia
Markowitz, Arnold Robert, *A.B., West Virginia University, 1940*......West Virginia
McCormack, Lloyd Leo, *University of Virginia*......................New Jersey
McFadden, Robert Burns, *B.S., Loyola College, 1940*.....................Maryland
McGrath, William Edward, Jr., *A.B., Loyola College, 1939*...............Maryland
McMullin, Joseph Frederick, *A.B., Ohio University, 1938*............Pennsylvania
Meade, DeVoe Kepler, *B.S., University of Maryland, 1940*..................Maryland
Miranda, Angel Neftali, *University of Puerto Rico*..................Puerto Rico
Morgan, Jack Calvin, *A.B., West Virginia University, 1940*..........West Virginia
Myers, Myron Joseph, *A.B., The Johns Hopkins University, 1940*...........Maryland
Nelson, Alfred Turner, *University of Michigan*..........................Maryland
Nesbitt, Isaac Floyd, B.S., *University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*.........................North Carolina

Ozazewski, John Casimir, *B.S., Loyola College, 1940*........Maryland
Palese, John Michael, *University of Maryland*........Maryland
Peters Robert Joseph, *West Virginia University*........Pennsylvania
Pfeil, Edgar Thornton, *University of Maryland*........Maryland
Pinas, Samuel Ronald, *B.S., University of Maryland, 1940*........Maryland
Pomeroy, William Henry, II, *B.S., Trinity College, 1938*........Connecticut
Raffucci-Arce, Francisco Luis, *University of Puerto Rico*........Puerto Rico
Range, James Jacob, *A.B., Duke University, 1940*........Tennessee
Ratliff, Cliff, Jr., *A.B., Duke University, 1940*........North Carolina
Ream, Norman, *B.S., Franklin and Marshall College, 1940*........Pennsylvania
Recht, John Munn, *A.B., Gettysburg College, 1940*........New Jersey
Rinehart, Arthur Middleton, *B.S., Trinity College, 1940*........Maryland
Robertson, Merritt Ezekiel, *A.B., Tusculum College, 1940*........North Carolina
Rogers, George Carraway, *A.B., University of North Carolina, 1939*..North Carolina
Rogers, William Brannon, Jr., *B.S., University of Akron, 1940*........Ohio
Santiago, Stevenson Parker, *A.B., Maryville College, 1940*........Puerto Rico
Sapareto, Rocco Louis, *B.S., Tufts College, 1939*........Massachusetts
Scherlis, Irving, *A.B., The Johns Hopkins University, 1940*........Maryland
Shipley, Frank Mollman, *A.B., Western Maryland College, 1940*........Maryland
Shortle, James Samuel, *B.S., University of New Mexico, 1939*........New Mexico
Sones, Frank Mason, Jr., *A.B., Western Maryland College, 1940*........Maryland
Stegall, John Thomas, *B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1940–1942*........North Carolina
Sterling, Harold, *B.S., University of Maryland, 1940*........District of Columbia
Strobel, Martin Edward, *A.B., Gettysburg College, 1940*........Maryland
Summerlin, Glenn Olson, *Emory University*........Florida
Thompson, Talmadge Stanley, *University of Maryland*........Maryland
Tilt, Leroy Wortendyke, Jr., *A.B., Oberlin College, 1939*........Maryland
Vargas, Dharma Luz, *B.S., University of Puerto Rico, 1940*........Puerto Rico
Waldrop, Grayson Spencer, *A.B., University of North Carolina, 1940*..North Carolina
Walkup, Harry Ernest, *West Virginia University*........West Virginia
West, George Brooks, Jr., *B.S., College of William and Mary, 1940*........Virginia
Will, David Reid, *Ohio State University*........Ohio
Williams, Thomas Richard, Jr., *A.B., Duke University, 1940*........North Carolina
Ziegler, Paul Randall, *University of Maryland*........Maryland

JUNIOR CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

Alvarez, José Alberto, *University of Puerto Rico*........Puerto Rico
Anchell, Melvin, *B.S., University of Maryland, 1941*........Maryland
Ardinger, Joseph Stanley, Jr., *University of Maryland*........Maryland
Bacon, Arthur Maynard, Jr., *B.S., Loyola College, 1941*........Maryland
Bell, Houston Lesher, *University of Maryland*........Maryland
Bloxom, John Madison, III, *B.S., University of Virginia, 1941*........Virginia
Brady, Charles Eldon, *A.B., University of North Carolina, 1939*........North Carolina
Brady, Frank Joseph, *B.S., Washington College, 1941*........Maryland
Brandes, Herbert Gibbs, *University of Maryland*........District of Columbia
Brill, Warren Daniel, *B.S., University of Maryland, 1941*........Maryland
Brown, Richard James, *University of Maryland*........Connecticut
Buckey, Robert Bruce, *A.B., University of New Mexico, 1941*........Maryland
Callahan, Daniel Harry, Jr., *B.S., Bowdoin College, 1941*........Massachusetts
Carr, Charles Edwin, Jr., *B.S., Loyola College, 1941*........Maryland
Chaput, Charles Dupre, *A.B., Dartmouth College, 1941*........Massachusetts
Cintrôn, Miguel, *West Virginia University*........Puerto Rico
Cloninger, Rowell Connor, *A.B., Lenoir Rhyne College, 1942*........North Carolina
Copeland, Herbert Bernard, Jr., *West Virginia University*........West Virginia
Cowley, R. Adams, *University of Utah*........Utah
Dodd, Patricia, *University of Maryland*........Georgia
Doukas, James A., *B.S., Washington College, 1941*........Maryland
Drake, Miles Edward, *B.S., Oregon State College, 1933; M.S., Oregon State College, 1934; Ph. D., University of Southern California, 1938*........Maryland
Ebeling, William Carl, III, *University of Maryland*........Maryland
Elias, Thomas Glenn, *A.B., Western Maryland College, 1941*........Maryland
Everett, John Thomas, *B.S., Mt. St. Mary's College, 1941*........Maryland

Farkas, Robert William, *A.B., University of Maryland, 1941*...........Pennsylvania
Feaster, James Henry, Jr., *A.B., West Virginia University, 1941*.......West Virginia
Feldman, Maurice, Jr., *A.B., The Johns Hopkins University, 1941*.........Maryland
Foard, Wilbur Harper, *Asbury College*..................................Maryland
Futterman, Perry, *A.B., The Johns Hopkins University, 1941*.............Maryland
García y García, José Antonio, *B.S., University of Puerto Rico, 1941*.......Puerto Rico
Gassaway, Franklyn Drennan, *University of Maryland*...................Arizona
Godlove, John Carlton, *A.B., Dickinson College, 1933*...................Maryland
Goldstein, Marvin, *A.B., The Johns Hopkins University 1941*............Maryland
Grumbine, Francis Levine, *A.B., Western Maryland College, 1941*..........Maryland
Guthrie, William Wilkinson, *A.B., University of Pennsylvania, 1941*.....West Virginia
Guy, Ernest Gordon, *B.S., University of North Carolina, 1941; University of North Carolina School of Medicine, 1941–1943*..................North Carolina
Hamill, James Edward, *B.S., University of Maryland, 1941*................Maryland
Hayden, Richard Carroll, *University of Maryland*.......................Maryland
Herold, Paul Garmer, *Duke University*..................................Maryland
Hobelmann, Charles Frederick, *A.B., The Johns Hopkins University, 1941*.Maryland
Holljes, Henry Wirt Duvall, *A.B., Western Maryland College, 1941*.......Maryland
Horn, Helen Amelia, *A.B., Goucher College, 1941*........................Maryland
Houska, Henry John, *A.B., Loyola College, 1941*.........................Maryland
Ingram, Phyllis Ray, *University of Vermont*.............................Maryland
Ingram, William Braxton, *B.S., University of North Carolina, 1942; University of North Carolina School of Medicine 1941–1943*................North Carolina
Jernigan, John Mayo, Jr., *B.S., University of Maryland, 1941*.............Maryland
Jones, Bobby Lee, *B.S., University of Maryland, 1941*....................Maryland
Kishpaugh, Marjorie Bird, *B.S., Lebanon Valley College, 1941*..........Pennsylvania
Kreis, George Joseph, Jr., *B.S., University of Maryland, 1941*.............Maryland
Lambert, Herman James, Jr., *B.S., University of Hawaii, 1941*..............Georgia
Lampley, William Askew, *B.S., Furman University, 1941*............North Carolina
Lerman, Philip H., *B.S., University of Maryland, 1940*...................Maryland
Levine, Stuart Charles, *B.S., University of Maryland, 1941*..............Maryland
Lilienfeld, Abraham Morris, *A.B., The Johns Hopkins University, 1941; Albany Medical College, 1941–1942*...Maryland
Littlefield, James Beaton, *A.B., University of Virginia, 1941*........Massachusetts
Maxwell, George Alexander, Jr., *University of Maryland*...............Maryland
Milloff, Bernard, *B.S., University of Maryland, 1941*....................Maryland
Mintzer, Donald Willis, *University of Maryland*......................New Jersey
Morrow, Thomas Lacy, Jr., *B.S., University of North Carolina, 1942; University of North Carolina School of Medicine, 1941–1943*..........District of Columbia
Mosberg, William Henry, Jr., *University of Maryland*...................Maryland
Norment, Richard Baxter, III, *University of Maryland*...................Maryland
O'Donnell, Charles Francis, *The Johns Hopkins University*..............Maryland
Osborne, William Wilson, *University of Georgia*..........................Georgia
Patterson, Carl Norris, *B.S., Franklin and Marshall College, 1941*........Maryland
Pierpont, Edwin Lowell, *University of Maryland*........................Maryland
Pool, Champe Clark, *A.B., West Virginia University, 1941*............West Virginia
Pratt, Louis John, *B.S., Loyola College, 1941*...........................Maryland
Ramundo, Micheal Raymond, *A.B., Syracuse University, 1941*............New Jersey
Randolph, Edward Burl, *West Virginia University*..................West Virginia
Rees, David Thomas, *A.B., West Virginia University, 1938*.............Pennsylvania
Riley, Eugene John, *University of Maryland*............................Maryland
Robbins, Morris Allen, *A.B., University of Pennsylvania, 1941*..........New Jersey
Rolfes, Harry Franklin, *University of Maryland*.........................Maryland
Rubenstone, Albert Irving, *A.B., University of Pennsylvania, 1941*.......Maryland
Scavone, Edmond, *B.S., Loyola College, 1941*............................Maryland
Schwartz, Aaron David, *A.B., University of Pennsylvania, 1941*...........New York
Seabright, Howard Lee, *A.B., Washington and Jefferson College, 1941*...West Virginia
Shaw, Charles Edward, Jr., *University of Maryland*.....................Maryland
Simons, George Murray, *University of Maryland*.........................Maryland
Spelsberg, Walter Karl, *University of Maryland*...................West Virginia
Steinberg, Stanley Herbert, *University of Maryland*...........District of Columbia
Stichel, Frederick Louis, Jr., *University of Maryland*...................Maryland
Taylor, Sarah Alice, *B.S., University of North Carolina, 1942; University of North Carolina School of Medicine, 1941–1943*..................North Carolina
Thompson, Lewis Bradford, *Dartmouth College*......................Massachusetts

Tinker, Francis Paul, *B.S., Loyola College, 1941*........................Maryland
Traband, Millard Tolson, Jr., *B.S., University of Maryland, 1937*........Maryland
Turner, Roy Byron, Jr., *B.S., University of Maryland, 1943*....District of Columbia
Ullsperger, John Francis, *A.B., Loyola College, 1941*....................Maryland
Wehling, Benjamin Bird, *B.S., Wheaton College, 1941*........................Ohio
Wilkins, Kenneth Worth, *B.S., University of North Carolina, 1942; University of North Carolina School of Medicine, 1941–1943*...............North Carolina
Wilson, Mary Stuart, *A.B., Randolph-Macon College, 1941*...............Maryland
Wooden, Allen Curtis, *B.S., Wake Forest College, 1941*..................Maryland
Woodrum, Olin Cain, *The Johns Hopkins University*......................Maryland
Wright, Isaac Clark, *B.S., University of North Carolina, 1942; University of North Carolina School of Medicine, 1941–1943*.................North Carolina
Yaffe, Stanley Norman, *B.S., University of Maryland, 1941*..............Maryland

SOPHOMORE CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

Amsterdam, Benjamin, *B.S., University of Maryland, 1942*..........New Jersey
Anderson, George Hagan, *B.S., University of Florida, 1942*...............Florida
Arnold, Gayle Gardner, *A.B., The Johns Hopkins University, 1942*........Maryland
Ayd, Frank Joseph, Jr., *A.B., Loyola College, 1942*......................Maryland
Barker, David Hargis, *B.S., University of Maryland, 1943*................Maryland
Barnes, Thomas Gordon, *A.B., Emory University, 1942*....................Georgia
Baroody, Philip Charles, *A.B., St. Anselm's College, 1942*..........New Hampshire
Bell, David Fowler, Jr., *B.S., University of Maryland, 1942*..............Maryland
Berdiansky, Benjamin, *A.B., The Johns Hopkins University, 1942*..........Maryland
Brannen, Joseph Harrison, *A.B., Emory University, 1942*.................Georgia
Brendle, William Kendig, *B.S., University of Maryland, 1942*.............Maryland
[1]Brosemer, Lowell Russell, *A.B., University of California, 1942*........California
Byrne, Robert Francis, B.S., *University of Maryland, 1943*................Maryland
Callender, George Russell, Jr., *B.S., University of Maryland, 1943*
District of Columbia
Camponeschi, Oscar Wilde, *B.S., University of Maryland, 1942*............Maryland
Canter, Nathan, *B.S., Loyola College, 1942*...............................Maryland
Clark, Mary Dorcas, *West Virginia University*.......................Pennsylvania
Conner, Eugene Hayward, *University of Maryland*.........................Maryland
Cook, Sallie, *A.B., University of Pennsylvania, 1942*.......................Maryland
Davis, John Bernard, *University of Maryland*..............................Maryland
Davis, Ralph Fletcher, *B.S., University of Maryland, 1942*................Maryland
de Alba, Eduardo, Jr., *A.B., The Johns Hopkins University, 1942*......Panama, R. P.
Dennis, John Murray, *B.S., University of Maryland, 1943*..................Maryland
Doenges, John Pell, *A.B., Western Maryland College, 1942*................Maryland
Fitzpatrick, Vincent dePaul, Jr., *A.B., Loyola College, 1942*..............Maryland
Frank, William Henry, *University of Pittsburgh*.......................Pennsylvania
Ganey, Joseph Brannen, *A.B., Emory University, 1942*.....................Florida
Givens, Austin Edward, *A.B., Pomona College, 1942*.......................Maryland
Greenleaf, Helen Emily, *B.S., Bucknell University, 1941*.............New Jersey
Hall, Arthur Thomas, Jr., *B.S., Loyola College, 1942*......................Maryland
Hamburger, Daniel Oscar, *A.B., The Johns Hopkins University, 1942*........Maryland
Haynes, Howard Harry, Jr., *University of Utah*................................Utah
Hedrick, John Albert, *Marshall College*.......................West Virginia
Hennessy, John Francis, *A.B., The Johns Hopkins University, 1942*....New Jersey
Herrick, Stanley Edward, Jr., *B.S., Bowdoin College, 1942*..........Massachusetts
Herrmann, Albert Casper, *B.S., University of Maryland, 1943*............Maryland
Holbrook, William Addison, Jr., *B.S., University of Maryland, 1942*........Maryland
Hoyos-Napoleoni, Hector Anthony, *West Virginia University*..........Puerto Rico
Hutchins, Harry, *Emory University*..Georgia
Keister, Stephen Ridinger, *Duke Univerity*.........................Pennsylvania
Kelly, Alexander Palmer, Jr., *B.S., University of Maryland, 1943*..North Carolina
Kenworthy, Richard Albert, III, *Yale University*.........................Maryland
Kurland, Leonard Terry, *A.B., The Johns Hopkins University, 1942*.......Maryland
Lemen, Daniel Bair, *B.S., University of Maryland, 1943*...................Maryland
Linthicum, Charles Milton, *B.S., University of Maryland, 1943*............Maryland
Maguire, Henry Francis, *B.S., Washington College, 1942*..............New Jersey
McNinch, James Robinson, Jr., *A.B., Washington & Jefferson College, 1942*.Pennsylvania

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[1] Did not complete the year—illness.

Miller, Clarence Stockton, *University of Nevada*	Maryland
Myers, Paul Robert, *A.B., Western Maryland College, 1942*	Maryland
Norton, Alfred Simpson, *B.S., University of Maryland, 1943*	District of Columbia
O'Neill, Allen Jay, *B.S., University of Maryland, 1943*	Virgnia
Ott, Roy Hamilton, Jr., *A.B., Williams College, 1942*	New York
Owen, Arthur John, *A.B., Loyola College, 1942*	Maryland
Peck, Robert DeWitt, *A.B., West Virginia University, 1942*	West Virginia
Phillips, Malcolm Dudley, *Houghton College*	Maryland
Pike, Warren Horton, Jr., *B.S., Virginia Military Institute, 1942*	Indiana
Reahl, Joseph Edward, *B.S., Loyola College, 1942*	Maryland
Robinson, William Henry, *The Johns Hopkins University*	Maryland
Rosenblatt, Leah, *A.B., Hood College, 1942*	Maryland
Rosenthal, John Laucheimer, *A.B., The Johns Hopkins University, 1942*	Maryland
Rudo, Alvin David, *The Johns Hopkins University*	Maryland
Rudo, Marvin, *B.S., University of Maryland, 1942*	Maryland
Sanchez, Hilarion, Jr., *West Virginia University*	Puerto Rico
Sokolski, Edward John, *A.B., Norwich University, 1942*	Connecticut
Stedem, Anthony Frederick Augustine, Jr., *A.B., Loyola College, 1942*	Maryland
Steinbach, Stanley Roy, *A.B., The Johns Hopkins University, 1942*	Maryland
Stewart, Charles Wilbur, Jr., *The Johns Hopkins University*	Maryland
Strahan, Charles, Jr., *B.S., Dickinson College, 1942*	Maryland
Street, Russell Barber, Jr., *University of Wisconsin*	Massachusetts
Summerlin, Winston Lee, *University of Florida*	Florida
Tansey, John Jerome, *Brown University*	Massachusetts
Touchet, Mary Louise, *B.S., University of Maryland, 1943*	Maryland
Trevaskis, Allan Edward, *Harvard University*	Maryland
Trumbo, Robert Benson, *Emory University*	Florida
Wagner, Victor, *University of Pennsylvania*	New Jersey
Weinberg, Harold Herbert, *B.S., Loyola College, 1942*	Maryland
Weintraub, Joseph, *B.S., University of Maryland, 1942*	Maryland
Wheeler, Thomas Easson, *The Johns Hopkins University*	Maryland
White, Joseph McCurley, III, *B.S., Loyola College, 1942*	Maryland
Winslow, Oliver Parry, Jr., *The Johns Hopkins University*	Maryland
Woodward, Arthur Fletchall, *B.S., University of Maryland, 1942*	Maryland
Ziegler, John Bosley, *A.B., Gettysburg College, 1942*	Maryland
Zinberg, Norman Earl, *B.S., University of Maryland, 1942*	Maryland

FRESHMAN CLASS, APRIL 8, 1943 TO DECEMBER 23, 1943

Amlicke, Jeanne Dorothy, *B.S., University of Maryland, 1943*	New Jersey
Arnold, Jesse Hoyt, Jr., *University of North Dakota*	Maryland
Audet, Charles Henry, Jr., *University of Maryland*	Connecticut
Audet, Robert Joseph, *University of Maryland*	Connecticut
Bannen, William James, Jr., *B.S., Bethany College, 1943*	Pennsylvania
Bauer, Robert Edward, *A.B., The Johns Hopkins University, 1943*	Maryland
Benavent, Walter José, *B.S., University of Maryland, 1943*	Puerto Rico
Bonifant, Alfred Dement, *B.S., University of Maryland, 1943*	Maryland
Brickner, John George, III, *Loyola College*	Maryland
Brown, Eli Matthew, *University of Maryland*	Maryland
Brown, Robert Ray, *West Virginia University*	West Virginia
Buckner, Louise Paddon, *B.S., University of Maryland*	Maryland
Cano, Harold Vernon, *University of Maryland*	New Jersey
Carr, William Francis, *Mt. St. Mary's College*	Pennsylvania
Christopher, Thomas West, *Brown University*	Massachusetts
Clyman, Sidney Gary, *University of Maryland*	Maryland
Codd, Francis Ignatius, *B.S., University of Maryland, 1941*	Maryland
Cohn, Jerome Elias, *A.B., The Johns Hopkins University, 1943*	Maryland
Connor, Thomas Byrne, *A.B., Loyola College, 1943*	Maryland
Corasaniti, Rita Anne, *University of Maryland*	Maryland
Cross, Richard Joseph, Jr., *Mt. St. Mary's College*	Maryland
D'Antonio, Joseph, *Maryville College*	Maryland
Davis, John Edward, Jr., *Randolph-Macon College*	West Virginia
Diaz-Carazo, José, *B.S., Mt. St. Mary's College, 1942*	Puerto Rico

Driggs, Guy Kenneth, *University of Arizona*............Arizona
Eareckson, Vincent Offley, Jr., *University of Maryland*............Maryland
Eaton, Jay Warren, *University of Maryland*............Maryland
Eavey, James Lee, *B.S., Franklin and Marshall College, 1943*............Maryland
Fischer, Joseph Samuel, *A.B., The Johns Hopkins University, 1943*............Maryland
Fisher, George William, *B.S., Franklin and Marshall College, 1943*............Maryland
Friedman, Asher Arthur, *A.B., The Johns Hopkins University, 1943*............Virginia
Frye, Paul Eugene, *University of Maryland*............Maryland
Gaby, Samuel David, *A.B., The Johns Hopkins University, 1943*............Maryland
Gamble, John Reeves, Jr., *A.B., Emory University, 1943*............North Carolina
Gentry, William Daniel, Jr., *University of Maryland*............Maryland
Gerlach, James Johnson, *University of Colorado*............Maryland
Goetz, Abraham Aaron, *The Johns Hopkins University*............New York
Gray, Harry William, *University of Maryland*............Maryland
Greenfield, Duane Leonard, *A.B., Sioux Falls College, 1939; M.A., Columbia University, 1940*............Maryland
Hansen, Leland Jay, *Utah State Agriculture College*............Utah
Hardin, Henry Carter, Jr., *A.B., Emory University, 1943*............Florida
Harley, John Barker, *B.S., Dickinson College, 1943*............Maryland
Hawkins, Charles William, *University of Chattanooga*............Tennessee
Hefner, Charles Arthur, *West Virginia University*............West Virginia
Hendrickson, Edwin Okey, III, *The Johns Hopkins University*............Maryland
[1]Hill, Harry Edward, *B.S., University of Maryland, 1942*............Maryland
Hunter, J. Poulson, *B.S., University of Utah, 1943*............Utah
Hyman, Nathan Bernard, *The Johns Hopkins University*............Maryland
Jennings, Erwin Reeves, *Emory University*............Georgia
Kiel, August, *University of Maryland*............Maryland
Knapp, Harry Grove Robert, *University of Colorado*............North Dakota
Knox, Lawrence Joseph, *Loyola College*............Maryland
Latimer, John Howard, *University of Utah*............Utah
Levickas, Herbert Joseph, *University of Maryland*............Maryland
Macht, Allan Harris, *University of Maryland*............Maryland
Maholick, Leonard Thomas, *University of Maryland*............District of Columbia
Markley, Raymond Law, Jr., *A.B., Gettysburg College, 1943*............Pennsylvania
Marshall, Charles Benton, Jr., *Ohio University*............West Virginia
Massenburg, George Yellott, *Duke University*............Georgia
May, Robert Eugene, *A.B., Loyola College, 1942*............Maryland
McElfatrick, George Charles, *Dartmouth College*............Delaware
McPherson, Thomas Cotesworth, *Emory University*............Georgia
McWilliams, Clarence Emanuel, Jr., *A.B., Western Maryland College, 1943*..Maryland
Mintzer, Joseph Herman, *B.S., University of Maryland, 1943*............New York
Mitchell, John Armitage, *Gettysburg College*............Maryland
Morrison, John Edward, *The Johns Hopkins University*............Maryland
Nataro, Jerome Paul, *B.S., Seton Hall College, 1942*............Kentucky
Nelson, Robert Edwin, *Brown University*............Massachusetts
Nichols, Pomeroy, Jr., *Emory University*............North Carolina
North, Ellsworth Howard, Jr., *Columbia University*............Maryland
O'Hare, James Stewart, *B.S., Loyola College, 1943*............Maryland
O'Leary, Frank Michael, *B.S., Loyola College, 1943*............Maryland
Orrison, William Werner, *A.B., Western Maryland College, 1943*............Maryland
Osborne, Horace Henry, *University of Georgia*............Georgia
Park, William Favre, *University of Maryland*............Maryland
Paul, Earl Rupert, *University of Virginia*............Maryland
Peck, Clemmer Marcus, *B.S., Hampden-Sydney College, 1942*............West Virginia
Platt, Lois Irene, *A.B., Goucher College, 1931*............Maryland
Rawlins, John Calvin, *B.S., Western Maryland College, 1943*............Delaware
Reisch, Milton, *University of Maryland*............Maryland
Reiter, Ralph Alan, *Bridgewater College*............Maryland
Riley, Robert Annan, Jr., *Emory University*............Ohio
Roberts, James Alwin, *University of Maryland*............Maryland
Rossberg, Robert Crittenden, *University of Maryland*............Maryland

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[1] Entered Second Semester, Aug. 30, 1943.

Sacks, Sidney, *University of Maryland*	Maryland
Sewell, James Anderson, *Emory University*	Florida
Shallenberger, Frank Anthony, *Loyola College*	Maryland
Sills, David Nicholson, Jr., *University of Maryland*	Delaware
Smith, Edward Milton, Jr., *Loyola College*	Maryland
Smith, Edward Patrick, Jr., *Loyola College*	Maryland
Stallard, Clinton Wolfe, Jr., *West Virginia Institute of Technology*	West Virginia
Stewart, John Wilson, *Western Maryland College*	Maryland
Swindell, Herbert Van Arden, *University of Maryland*	Maryland
Toby, Leon, *A.B., The Johns Hopkins University, 1943*	Maryland
Vaughn, James Anderson, Jr., *A.B., Emory University, 1943*	Florida
Weitzman, Elliott Lionel, *The Johns Hopkins University*	Maryland
Wentz, Irl Jesse, *A.B., Western Maryland College, 1942*	Pennsylvania
Wlodkowski, Victor Thomas, *University of Maryland*	Maryland
Wolfe, Walter McIlhaney, Jr., *Virginia Military Institute*	Maryland
Workman, Joseph Berkeley, *A.B., Western Maryland College, 1943*	Maryland
Young, Alexander William, Jr., *University of Maryland*	West Virginia
Young, Richard Atlee, *A.B., Gettysburg College, 1943*	Maryland

SUMMARY OF STUDENTS

(April 8, 1943 to December 23, 1943)

	Male	*Female*	*Total*
Senior Class	85	5	90
Junior Class	90	6	96
[1] Sophomore Class	78	5	83
[2] Freshman Class	97	4	101
	350	20	370

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[1] One withdrawal.

[2] One admission.

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

(April 8, 1943 to December 23, 1943)

Alabama	2
Arizona	3
California	2
Connecticut	6
Delaware	3
District of Columbia	10
Florida	8
Georgia	11
Illinois	1
Indiana	1
Kentucky	1
Maryland (Baltimore 128)	193
Massachusetts	11
New Hampshire	1
New Jersey	14
New Mexico	1
New York	7
North Carolina	21
North Dakota	1
Ohio	4
Pennsylvania	19
Tennessee	2
Utah	5
Virginia	4
West Virginia	25
Foreign	
Republic of Panama	1
Puerto Rico	14

LIST OF COLLEGE SOURCES OF STUDENTS ENROLLED

Session—April 8, 1943 to December 23, 1943

Akron University	1
Alabama, University of	1
American University	1
Arizona, University of	1
Asbury College	1
Bates College	1
Bethany College	1
Boston College	1
Bowdoin College	2
Bridgewater College	1
Brown University	3
Bucknell University	1
California, University of	2
Chattanooga, University of	1
Colgate University	1
Colorado, University of	2
Columbia University	2
Connecticut, University of	1
Dartmouth College	3
Dickinson College	3
Duke University	10
Emory University	15
Florida, University of	2
Franklin & Marshall College	4
Furman University	1
Georgia, University of	3
Gettysburg College	6
Goucher College	1
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The University Hospital is a general hospital containing about 435 beds. It is equipped to give young women a thorough course of instruction and practice in all phases of nursing.

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The requirements for admission to the 30-month program are the satisfactory completion of an academic course in an approved high school. The completion of this course entitles the student to the diploma of the University of Maryland School of Nursing. Blank certificates will be furnished upon application to the Director of the School of Nursing.

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The Mercy Hospital School of Nursing was established in 1899 and incorporated on December 23, 1901. It is an integral part of the Mercy Hospital and is under the same government. Mercy Hospital affords exceptional advantages for the education of nurses. It is a general hospital containing 348 beds, and offers opportunities for a thorough and varied experience. By its institutional affiliation with the University of Maryland it secures Professors who give to the student the results of their training and experience in the fields of the medical and affiliated sciences.

The University of Maryland, in affiliation with the Mercy Hospital School of Nursing, offers a five year combined Academic and Nursing program. The completion of this course entitles the student to the degree of Bachelor of Science from the University of Maryland, and to the diploma of the Mercy Hospital School of Nursing. Graduate nurses who hold college degrees are greatly in demand, especially for positions in administration and teaching institutions. This program consequently offers a distinct advantage.

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